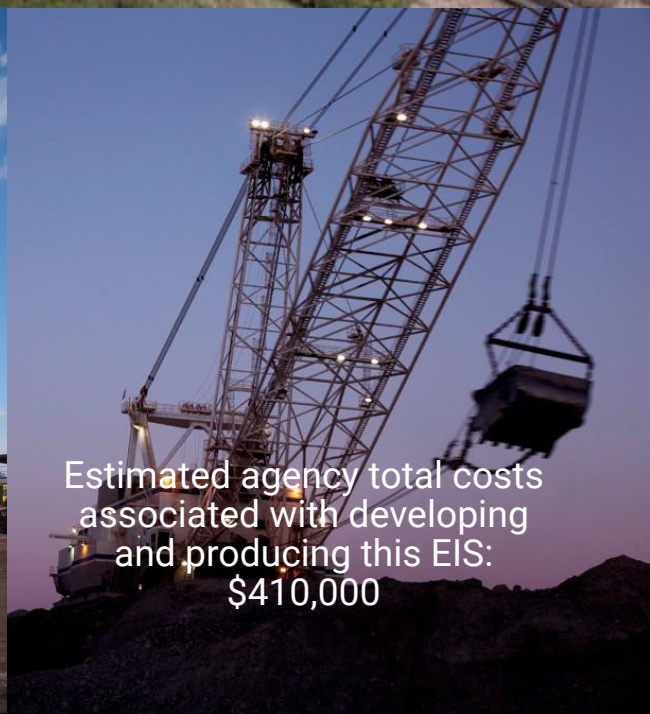
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

October 2019

Miles City Field Office

Final Supplemental Environmental Impact Statement and Proposed Resource Management Plan Amendment



Estimated agency total costs associated with developing and producing this EIS: $410,000

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Miles City Field Office
111 Garryowen Road
Miles City, MT 59301
www.blm.gov/mt/

Dear Reader:

Enclosed is the Proposed Resource Management Plan Amendment (RMPA)/Final Supplemental Environmental Impact Statement (FSEIS). The Proposed RMPA/FSEIS was prepared by the Bureau of Land Management (BLM) in consultation with various government agencies and organizations, taking into account public comments received during this planning effort. The purpose of the Proposed RMPA is to amend the 2015 Miles City Field Office RMP to provide additional land use planning-level analysis specifically regarding coal, oil, and gas, and to determine lands to be made available for coal leasing in the Miles City Field Office. The need for action is to respond to a United States District Court, District of Montana, opinion and order (*Western Organization of Resource Councils, et al. v. BLM*). The Proposed RMPA would replace decisions for coal allocations in the 2015 Miles City Field Office RMP/Record of Decision. The BLM has conducted new coal screening, in accordance with 43 CFR 3420.1–4.

Pursuant to the BLM's planning regulations at 43 CFR 1610.5-2, any person who participated in the planning process for this Proposed RMPA and has an interest which is or may be adversely affected by the planning decisions may protest approval of the planning decisions contained therein. The Proposed RMPA/FSEIS is open for a 30-day protest period beginning October 4, 2019.

The regulations specify the required elements of your protest. Take care to document all relevant facts. As much as possible, reference or cite the planning documents or available planning records (e.g. meeting minutes or summaries, correspondence, etc.).

Instructions for filing a protest with the Director of the BLM regarding the Proposed RMP Amendment and Final EIS may be found online at https://www.blm.gov/programs/planning-and-nepa/public-participation/filing-a-plan-protest and at 43 CFR 1610.5-2. All protests must be in writing and mailed to the appropriate address, as set forth below, or submitted electronically through the BLM ePlanning project website. Protests submitted electronically by any means other than the ePlanning project website protest section will be invalid unless a protest is also submitted in hard copy. Protests submitted by fax will also be invalid unless also submitted either through ePlanning project website protest section or in hard copy. All protests submitted in writing must be mailed to one of the following addresses:

All protests must be in writing and mailed to one of the following addresses:

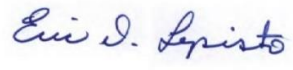
Regular Mail:	Overnight Delivery:
Director (210) Attn: Protest Coordinator P.O. Box 71383 Washington, D.C. 20024-1383	Director (210) Attn: Protest Coordinator 20 M Street SE, Room 2134LM Washington, D.C. 20003

All protests must be RECEIVED on or before November 4, 2019.

Before including your address, phone number, email address, or other personal identifying information in your protest, be advised that your entire protest – including your personal identifying information – may be made publicly available at any time. While you can ask us in your protest to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

The BLM Director will make every attempt to promptly render a decision on each protest. The decision will be in writing and will be sent to the protesting party by certified mail, return receipt requested. The decision of the BLM Director shall be the final decision of the Department of the Interior on each protest. Responses to protest issues will be compiled and formalized in a Director's Protest Resolution Report made available following issuance of the decisions. Upon resolution of all land use plan protests, the BLM will issue a Record of Decision (ROD). The ROD will be available to all parties at https://go.usa.gov/xmbE4.

Sincerely,



Eric Lepisto
Miles City Office Field Manager, Acting
Bureau of Land Management

Final Supplemental Environmental Impact Statement and Resource Management Plan Amendment Miles City Field Office, Montana

Responsible Agency:	United States Department of the Interior Bureau of Land Management	
Type of Action:	Administrative (X)	Legislative ( )
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Abstract: This Final Supplemental Environmental Impact Statement (SEIS) and Resource Management Plan Amendment (RMPA) augments analysis for the 2015 Miles City Field Office RMP. The SEIS updates the coal screens; analyzes two reduced coal alternatives; supplements analysis of coal, oil, and gas downstream emissions; and provides justification for the global warming potential analysis. The scope of the SEIS/RMPA is limited to amending coal leasing acceptability decisions from the 2015 RMP/Record of Decision (ROD). The RMPA would affect up to 11.7 million acres of subsurface federal coal estate in eastern Montana administered by the Bureau of Land Management (BLM) Miles City Field Office. The RMPA is limited to amending decisions regarding lands acceptable for further consideration for leasing from the 2015 RMP.

The BLM is the lead agency for the Final SEIS/RMPA with eight cooperating agencies initially participating in the plan development. Planning issues address leasable minerals, greenhouse gases, climate change, economics, water resources, cultural resources, fish and wildlife (including special status species), and lands and realty. The SEIS/RMPA considers three alternatives.

Alternative A, the No Action Alternative, continues management decisions for coal leasing availability under the 2015 RMP/ROD. Alternative B would update management decisions for coal leasing availability under the 2015 RMP/ROD based on a revised coal screen not contemplated when the coal development potential area was defined under Alternative A. Alternative B removes areas as unacceptable for further consideration for leasing under a multiple-use screen that considers conflicts with active oil and gas wells; active oil and gas units; perennial, riparian, and wetland resources; conservation easements; recreation areas; travel management areas; sport fishing reservoirs; areas of critical environmental concern; and cultural viewsheds. Alternative C uses the coal screens described under Alternative B, but it applies an additional multiple-use criterion for air resources. Under this alternative, coal availability would be restricted to an 8-mile infrastructure area around four existing mines.

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
ACEC	area of critical environmental concern
AML	abandoned mine land
BCF	billion cubic feet
BLDTF	Black Lung Disability Trust Fund
BLM	United States Department of the Interior, Bureau of Land Management
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
DOI	United States Department of the Interior
EIA	US Energy Information Administration
EPA	Environmental Protection Agency
ESA	Endangered Species Act
°F	degrees Fahrenheit
FLIGHT	Facility Level Information on Greenhouse Gases Tool
FLPMA	Federal Land Policy and Management Act
FR	*Federal Register*
GHG	greenhouse gas
GIS	geographic information system
GWP	global warming potential
IMPLAN	Impact Analysis for Planning Model
IPCC	Intergovernmental Panel on Climate Change
IRS	Internal Revenue Service
MCFO	Miles City Field Office
MFWP	Montana Fish, Wildlife and Parks
MMst	million metric short tons
MMT	million metric tons
N_2O	nitrous oxide
NCA	National Climate Assessment
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NRHP	National Register of Historic Places
PRB	Powder River Basin
RFD	reasonably foreseeable development
RMP(A)	resource management plan (amendment)
ROW	right-of-way

(S)EIS	(supplemental) environmental impact statement
SHPO	State Historic Preservation Office
US	United States
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WSA	wilderness study area
WSR	Wild and Scenic River

Executive Summary

ES.1 INTRODUCTION

In accordance with the National Environmental Policy Act of 1969, as amended (NEPA), and the Federal Land Policy and Management Act of 1976, as amended (FLPMA), the Bureau of Land Management (BLM) Montana Miles City Field Office (MCFO) prepared this supplemental environmental impact statement (SEIS) to the 2015 Proposed Resource Management Plan (RMP)/Final EIS and RMP amendment (RMPA) to the 2015 Approved RMP. The BLM prepared this Final SEIS/Proposed RMPA in accordance with NEPA; the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500–1508); Department of Interior NEPA regulations (43 CFR 46); and the requirements of the BLM's NEPA Handbook, H-1790-1 (BLM 2008).

This SEIS/RMPA is in response to the federal district court's order in *Western Organization of Resource Councils, et al. v. Bureau of Land Management,* Civil Action No. CV 16-21-GF-BMM (D. Mont. 2017) (hereinafter, "order"). The court's order found that the 2015 MCFO Final EIS was inadequate in three areas (the range of alternatives in relation to coal availability; downstream combustion of coal; and justification of the time-horizon for analyzing greenhouse gas emissions). The court's order directed the BLM to supplement analysis to resolve NEPA deficiencies in the 2015 EIS. Through this SEIS/RMPA, the BLM will analyze a range of alternatives for coal availability not analyzed in the 2015 Proposed RMP/Final EIS (including new coal screening), analyze the climate change impacts of coal leasing, and analyze the downstream environmental consequences of fossil fuel combustion, including global warming potential over a 100-year time horizon.

The SEIS/RMPA will be used to decide whether to amend the 2015 Approved RMP (BLM 2015b), and it will guide management of public lands administered by the MCFO into the future. Information about the SEIS/RMPA process can be obtained on the ePlanning website.[1]

The 2015 Approved RMP/Record of Decision was completed in September 2015 and provides management guidance and direction for approximately 2.75 million acres of BLM-administered surface land and 11.9 million acres of subsurface federal mineral estate in 17 eastern Montana

[1] https://go.usa.gov/xmbE4

counties. BLM management applies only to public lands, meaning those lands where the BLM has management responsibility for either the surface or the subsurface estate. **Figure ES-1** provides a map of the decision area. Except as described in **Section ES.2**, planning decisions remain valid.

ES.2 PURPOSE OF AND NEED FOR THE RESOURCE MANAGEMENT PLAN AMENDMENT

The purpose of this SEIS/RMPA is to provide additional land use planning-level analysis specifically regarding coal and oil and gas in the MCFO and to determine the lands to be made available for coal leasing. To support analysis in the SEIS/RMPA and subsequent decision-making, the BLM has conducted new coal screening, in accordance with 43 CFR 3420.1–4.

This SEIS/RMPA is needed in order to satisfy the following:

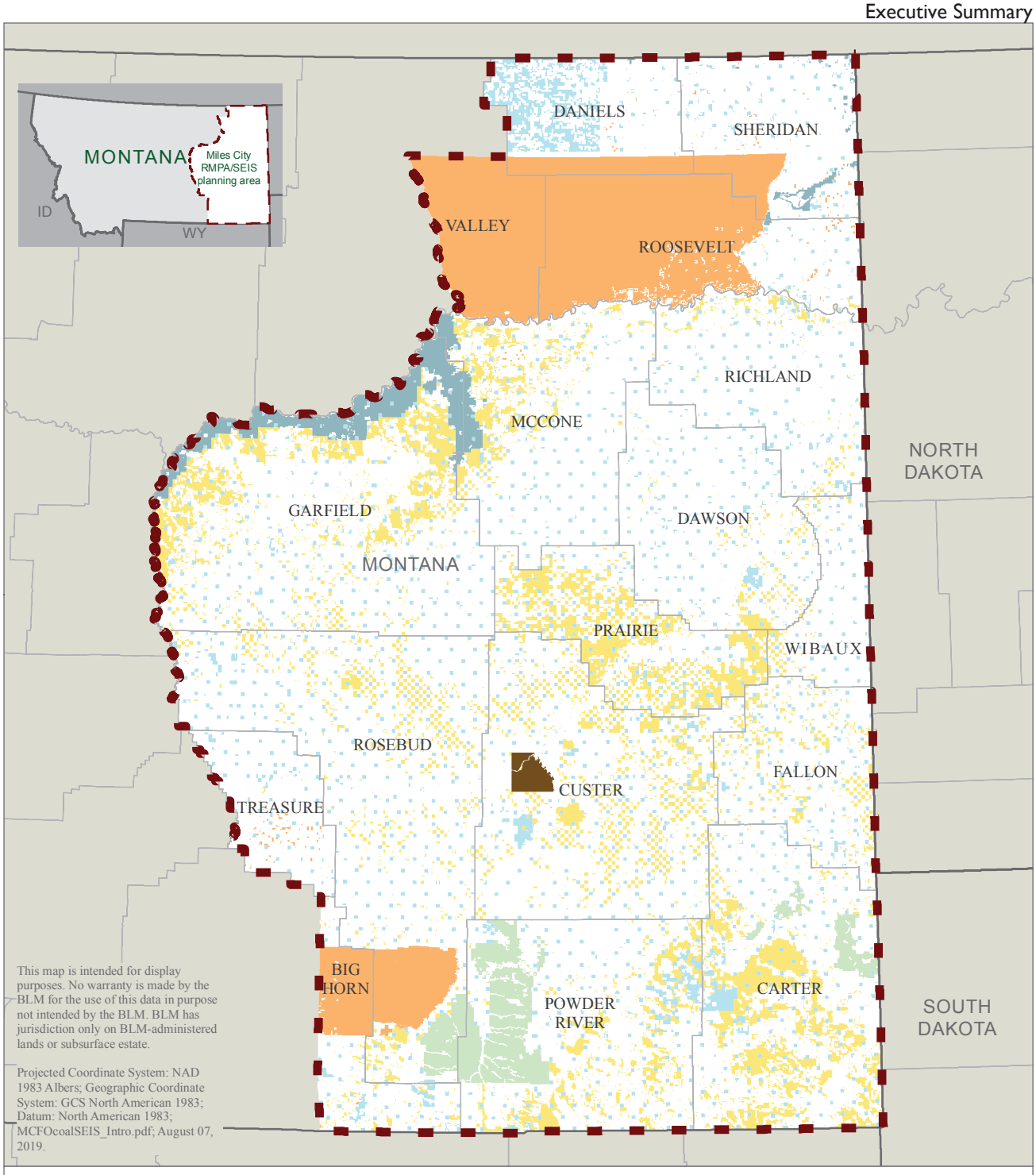
- Consider an alternative that would reduce the amount of recoverable coal[2] and consider climate change impacts, in order to make a reasoned decision on the amount of recoverable coal made available
- Supplement the analysis of the environmental consequences of downstream combustion of coal and oil and gas open to development
- Justify the time horizon of the estimated global warming potential impacts (e.g., 20-year or 100-year) and to acknowledge the evolving science in this area

ES.3 SCOPING

The MCFO SEIS/RMPA public scoping process began on November 28, 2018, with publication of the Notice of Intent (NOI) in the *Federal Register* (FR) (83 FR 61167); it ended on December 28, 2018. On November 26, the BLM solicited comments from federal, state, and local agencies; Native American tribes; the public; stakeholders; and other interested parties. On December 13, the BLM MCFO conducted a public scoping meeting and a meeting with cooperating agencies at the field office in Miles City, Montana. The BLM announced the meeting through the NOI in the *Federal Register*, the ePlanning website, and news releases. The BLM MCFO has provided public access to SEIS/RMPA-related information on its ePlanning website.

During the public scoping period, the BLM received 32 unique written submissions, comprising 447 substantive comments. The BLM put the comments into seven issue categories. Most comments were received for resource-specific issues: coal, oil and gas, air quality, climate change, economic issues, best available information/baseline data, and the range of alternatives. Detailed information can be found in the scoping report on the MCFO SEIS/RMPA ePlanning website.

[2]The amount of recoverable coal, for the purposes of this SEIS, is the estimate of acres of coal potential identified in Screen 1. The acreage of recoverable coal available for leasing is calculated by applying all four coal screens.



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MILES CITY FIELD OFFICE

1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure ES-1
Surface Administration

- Private or other
- BIA or Indian Reservation
- Bureau of Land Management
- US Forest Service
- US Fish and Wildlife Service
- Other Federal Lands
- State

The BLM sent letters to eligible federal, state, and local agencies and tribes inviting them to be cooperating agencies and to assist with the SEIS/RMPA. The tribal letters also asked if the tribes wanted to initiate formal government-to-government consultation. The BLM held a cooperating agency meeting prior to the public scoping meeting on December 13, 2018.

ES.4 ISSUES

The BLM read and reviewed all 447 scoping comments received and categorized them into the following 7 issue categories:

- Best available information/baseline data
- Cumulative impacts
- Direct/indirect impacts
- Federal Land Policy and Management Act of 1976
- Other laws
- Range of alternatives
- Resource specific

The BLM further categorized the 447 comments received that pertained to resources and resource uses based on the specific resource or resource use. The Miles City Field Office SEIS and RMPA Scoping Report (BLM 2019) shows the number of comments by specific resource or resource use. Resource topics analyzed in detail are air resources, including greenhouse gases and climate change; water resources; wildlife, including special status species; lands and realty; cultural resources; and economics.

ES.5 PLANNING CRITERIA

Planning criteria guide development of the SEIS/RMPA by defining the decision space. 43 CFR 1610.4-2(b) states that the "Planning criteria will generally be based upon applicable law, Director and State Director guidance, the results of public participation, and coordination with any cooperating agencies and other Federal agencies, State and local governments, and federally recognized Indian tribes."

Planning criteria represent the overarching factors used to resolve issues and to develop alternatives. The planning criteria considered in the development of this document are as follows:

- The SEIS/RMPA complies with NEPA, FLPMA, and other applicable laws, executive orders, regulations, and policy.
- Lands covered in the SEIS/RMPA are federal lands, including split estate,[3] managed by the BLM. No decisions will be made relative to non-BLM-administered lands.
- The SEIS/RMPA makes land use planning decisions to allocate lands acceptable for further consideration for coal leasing.

[3] Split estate is subsurface federal coal overlain by state or private surface lands within the decision area.

- The SEIS/RMPA uses a collaborative and multi-jurisdictional approach to determine the desired future condition of public lands.
- Decisions in the plan are compatible with existing plans and policies of adjacent local, state, federal, and tribal agencies, as long as the decisions are consistent with the purposes, policies, and programs of federal law and regulations applicable to public lands.
- The SEIS/RMPA recognizes valid existing rights.
- The SEIS/RMPA does not change existing planning decisions that are still valid.

ES.6 MANAGEMENT ALTERNATIVES

Issues identified through the BLM's scoping efforts and the court's order helped the interdisciplinary team identify three management alternatives. The BLM's action alternatives update and modify the coal screen used to determine coal suitability (**Appendix A**), resulting in a range of areas identified as acceptable for further consideration for coal leasing. **Table ES-1**, below, shows a comparison of alternatives.

Table ES-1
Alternatives Summary and Coal Acceptability Determination[1]

Alternative	Acres Acceptable	Acres Unacceptable
Alternative A: No Action Alternative	1,581,240	325,430
Alternative B	1,214,380	530,420
Alternative C	158,400	1,586,400

Sources: BLM 2015a; BLM GIS 2019

[1] Acres unacceptable for further consideration for coal leasing and development are those without coal potential or lands that were identified as unacceptable for further consideration for leasing under the multiple-use screen, through the landowner consultation screen, and those that are unsuitable without exception under the unsuitability screen. In accordance with 43 CFR 3461.2-1, the BLM could, based on additional site-specific surveys or changes in resource conditions, change the unsuitability determination for screen 2 unsuitability of a given tract at the activity planning stage.

ES.6.1 Alternative A: No Action Alternative

For the No Action Alternative, the BLM brought forward management decisions from the coal screens performed for the Powder River and Big Dry RMPs into the 2015 Proposed RMP/Final EIS. The coal screens from the Powder River and Big Dry RMPs are included in the *Minerals Appendix* to the 2015 Proposed RMP/Final EIS. Although the coal screen is the same as the 2015 RMP, Alternative A uses the updated reasonably foreseeable development scenario to forecast production and surface disturbance within areas acceptable for further consideration for coal leasing.

ES.6.2 Alternative B (Proposed Plan Amendment)

For Alternative B, new coal screens were applied to determine lands acceptable for further consideration for coal leasing. **Appendix A** includes the new detailed coal screens and their supporting data. An air quality criterion was considered as a multiple-use coal screen under this alternative.

Alternative B considers a criterion for maintaining air quality standards as part of the multiple-use screen; however, existing data and modeling done for the 2015 Proposed RMP/Final EIS showed no air quality standards were exceeded based on the national ambient air quality standards under the Clean Air Act. Therefore, no resulting geographic area of land was unsuitable for further consideration for coal leasing based on air resources.

In addition, this alternative removes lands as unacceptable for further consideration for leasing under the multiple-use screen that considers conflicts with active oil and gas wells; active oil and gas units; perennial, riparian, and wetland resources; conservation easements; recreation areas; travel management areas; sport fishing reservoirs; areas of critical environmental concern; and cultural viewsheds.

ES.6.3 Alternative C

Alternative C uses the same coal screen applications for Screen 1 (coal potential), Screen 2 (unsuitability), and Screen 4 (landowner consultation) as Alternative B (**Appendix A**). For the multiple-use coal screen (Screen 3), Alternative C applies an additional air resource criterion based on greenhouse gas emissions that would result from additional transportation to deliver coal to the existing infrastructure. The air resource criterion limits coal development to an 8-mile infrastructure area around the four existing mines in the decision area. The 8-mile area encompasses existing transportation infrastructure (for example, haul roads, conveyor belts, and railroad loops) associated with load-out facilities at the existing mines.

ES.7 Environmental Consequences

The purpose of the environmental consequences analysis in this SEIS/RMPA is to determine the potential for significant impacts of the federal action related to lands to be made acceptable for further consideration for coal leasing. The Council on Environmental Quality regulations for implementing NEPA state that the "human environment" is interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14). The "federal action" is the BLM's selection of an RMPA on which future land use actions related to coal availability will be based for the MCFO.

Table 1-3 of **Chapter 1** lists resources eliminated from the impacts analysis. Resources carried forward for analysis are included in **Chapter 3**, which objectively evaluates the likely direct, indirect, and cumulative impacts on the human and natural environment in terms of environmental, social, and economic consequences that are forecasted to occur from implementing the alternatives.

Because the coal RFD scenario developed for this SEIS/RMPA is the same for all of the alternatives, and because those areas that are unsuitable for surface mining or surface mining operations with exceptions would still need to be mitigated in order to be developed, the impacts would not substantially vary by alternative. Furthermore, impacts are substantially similar to those disclosed in the 2015 Proposed RMP/Final EIS (BLM 2015a). Under Alternative A, there would be a slight reduction in impacts from those disclosed in 2015 because this coal RFD scenario forecasts a smaller disturbance area than the RFD scenario used in the 2015 Proposed RMP/Final EIS.

Chapter 1. Purpose and Need

1.1 INTRODUCTION

In accordance with the National Environmental Policy Act of 1969, as amended (NEPA), and the Federal Land Policy and Management Act of 1976, as amended (FLPMA), the Bureau of Land Management (BLM) Montana Miles City Field Office (MCFO) prepared this supplemental environmental impact statement (SEIS) to the 2015 Proposed Resource Management Plan (RMP)/Final EIS and RMP amendment (RMPA) to the 2015 Approved RMP. This Final SEIS/Proposed RMPA is in response to the federal district court's order in *Western Organization of Resource Councils, et al. v. Bureau of Land Management,* Civil Action No. CV 16-21-GF-BMM (D. Mont. 2017) (hereinafter, "order").

The BLM prepared this SEIS/RMPA in accordance with NEPA; the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500–1508); Department of Interior NEPA regulations (43 CFR 46); and the requirements of the BLM's NEPA Handbook, H-1790-1 (BLM 2008).

1.2 PURPOSE OF AND NEED

The purpose of this SEIS/RMPA is to provide additional land use planning-level analysis specifically regarding coal and oil and gas in the MCFO and to determine the lands to be made available for coal leasing. To support analysis in the SEIS/RMPA and subsequent decision-making, the BLM has conducted new coal screening, in accordance with 43 CFR 3420.1–4.

This SEIS/RMPA is needed in order to satisfy the following:

- Consider an alternative that would reduce the amount of recoverable coal[1] and consider climate change impacts, in order to make a reasoned decision on the amount of recoverable coal made available

[1]The amount of recoverable coal, for the purposes of this SEIS, is the estimate of acres of coal potential identified in Screen 1. The acreage of recoverable coal available for leasing is calculated by applying all four coal screens.

- Supplement the analysis of the environmental consequences of downstream combustion of coal and oil and gas open to development
- Justify the time horizon of the estimated global warming potential impacts (e.g., 20-year or 100-year) and to acknowledge the evolving science in this area

1.3 DESCRIPTION OF THE DECISION AREA

The MCFO administers approximately 2.75 million acres of surface lands and 11.9 million acres of subsurface federal mineral estate in 17 eastern Montana counties. The decision area for this SEIS is the BLM-administered federal coal in the MCFO. This includes approximately 11.7 million acres of subsurface federal mineral coal estate for which the BLM has the authority to determine its availability (98 percent of federal mineral estate within the MCFO; **Figures 1-1** and **1-2**).

1.4 SCOPING ISSUES

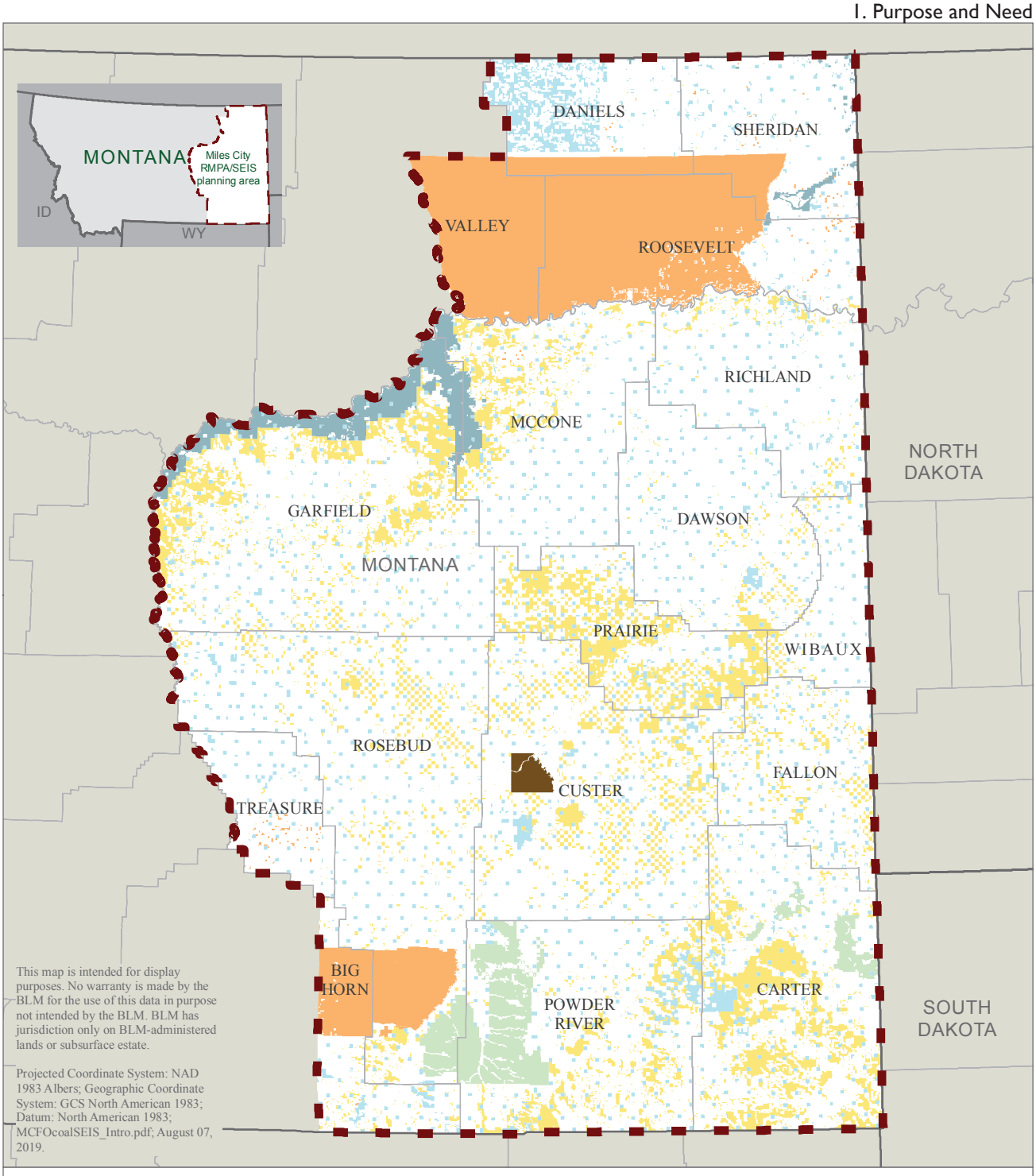
The MCFO SEIS/RMPA public scoping process began on November 28, 2018, with publication of the Notice of Intent (NOI) in the *Federal Register* (FR) (83 FR 61167); it ended on December 28, 2018. On November 26, the BLM solicited comments from federal, state, and local agencies; Native American tribes; the public; stakeholders; and other interested parties. On December 13, the BLM MCFO conducted a public scoping meeting and a meeting with cooperating agencies at the field office in Miles City, Montana. The BLM announced the meeting through the NOI in the *Federal Register*, the ePlanning website,[2] and news releases. The BLM MCFO has provided public access to SEIS/RMPA-related information on its ePlanning website.

During the public scoping period, the BLM received 32 unique written submissions, comprising 447 substantive comments. The BLM put the comments into seven issue categories. Most comments were received for resource-specific issues: coal, oil and gas, air quality, climate change, economic issues, best available information/baseline data, and the range of alternatives. Detailed information can be found in the scoping report on the MCFO SEIS/RMPA ePlanning website.

1.4.1 Issues Identified for Detailed Consideration

Planning issues are disputes or controversies about existing and potential land and resource allocations, levels of resource use, production, and related management practices (BLM Land Use Planning Handbook H-1601-1; BLM 2005). These issues help inform alternatives development. A detailed description of the planning issues identified during public scoping can be found in the scoping report on the MCFO SEIS/RMPA ePlanning website. **Table 1-1** aligns the planning issues identified for detailed consideration with the resources affected by the issues. **Chapter 3** analyzes the issues as they pertain to the identified resources.

[2] https://go.usa.gov/xmbE4



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MILES CITY FIELD OFFICE

1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure 1-1
Surface Administration

- Private or other
- BIA or Indian Reservation
- Bureau of Land Management
- US Forest Service
- US Fish and Wildlife Service
- Other Federal Lands
- State

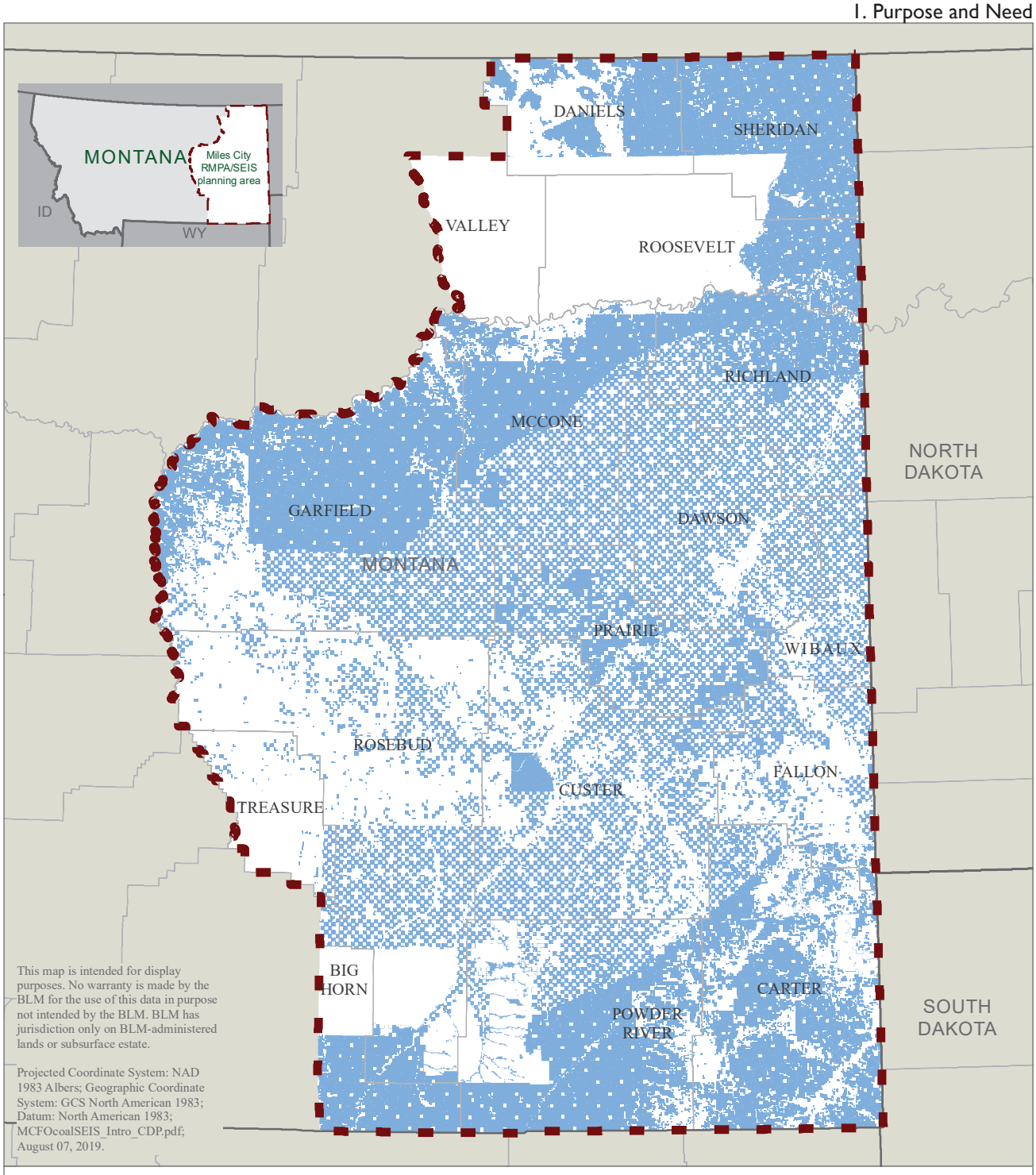


Figure 1-2
BLM-administered Coal

Federal mineral coal estate

Table 1-1
Scoping Issues and Resource Topics Affected

Issue	Resource Topic Affected
What new information will be referenced in the SEIS/RMPA?	Air resources (including greenhouse gases and climate change), coal, and socioeconomics will all be updated, based on the following: • 2018 minerals production data • New coal screening using current data • Updated reasonably foreseeable development scenario • Greenhouse gas emissions inventory and downstream emissions
What are the cumulative impacts of the proposed actions?	See **Chapter 3** for the cumulative impacts analysis for resources carried forward.
What are the direct and indirect impacts of the proposed actions?	See **Chapter 3** for the impacts analysis for resources carried forward.
Will the SEIS/RMPA analyze a no leasing alternative? What alternatives will be included in the SEIS/RMPA?	See **Chapter 2** for a range of alternatives.
What methods will be used to address downstream impacts of fossil fuel leasing and use?	See **Chapter 3**, Air Resources.
Will the BLM quantify downstream combustion emissions for fossil fuels, analyze the impacts of these emissions with available methods under each alternative, and study the extent to which the alternatives (including a no leasing alternative) alter the total amount of downstream greenhouse gas emissions?	See **Chapter 2** for a range of alternatives and **Chapter 3**, Air Resources.
How will the BLM comply with the multiple-use mandate of FLPMA?	This SEIS augments the existing RMP, meeting the multiple-use mandate of FLPMA. The BLM considered multiple uses during evaluation of Screen 3; see **Appendix A**.
How will the BLM comply with the requirements of the final judgment issued by the district court?	See **Chapter 1** for the purpose and need, **Chapter 2** for the range of alternatives, **Chapter 3**, Air Resources, and **Appendix A**.
What sources of air emissions will be included in the SEIS/RMPA?	See **Chapter 3**, Air Resources.
How do regional emissions compare with federal emissions?	See **Chapter 3**, Air Resources.
How will greenhouse gas emissions be quantified and analyzed in the potential actions to avoid regional and national greenhouse gas emissions?	See **Chapter 3**, Air Resources, and **Appendix B**.
Will there be a federal emissions baseline?	See **Chapter 3**, Air Resources.
Will the BLM update global warming potential data for methane?	See **Chapter 3**, Air Resources.
Will the SEIS/RMPA incorporate the newest National Climate Assessment and other national and state climate literature?	See **Chapter 3**, Air Resources.
Where have previous cultural resource surveys been conducted, and will the BLM include the results of previous surveys in the SEIS? How will the BLM maintain compliance with the National Historic Preservation Act?	See **Chapter 3**, Cultural Resources, and **Appendix A**.
How will the BLM identify cultural resource sites that the proposed action may disturb?	See **Chapter 3**, Cultural Resources, and **Appendix A**.

Issue	Resource Topic Affected
How will the BLM analyze the impact of the proposed action on declining wildlife habitat and populations, and how will it mitigate impacts?	See **Chapter 3**, Special Status Species and Fish and Wildlife, and **Appendix A**.
How will the BLM analyze the impacts of noise on wildlife?	See **Chapter 3**, Fish and Wildlife, and **Appendix A**.
Will the BLM conduct new coal screening for the planning area?	See **Appendix A**.
How will the BLM consider circumstances that have changed since the 2015 Proposed RMP/Final EIS?	See **Appendices A** and **C**.
What is the economic contribution of the external costs of mining, transporting, and burning coal?	See **Chapter 3**, Economic Considerations.
What tools will the BLM use to examine the economic contribution to the region from fossil fuel employment?	See **Chapter 3**, Economic Considerations, and **Appendix D**.
How will coal development affect lands and realty in the planning area?	See **Chapter 3**, Lands and Realty, and **Appendix A**.

1.4.2 Issues Considered but Not Further Analyzed in this SEIS/RMPA

The issues identified during public scoping (discussed above) shaped the alternatives carried forward in this SEIS/RMPA. The BLM also considered other issues identified during public scoping but did not analyze them further; this is because they fall outside the BLM's jurisdiction, are beyond the scope of this SEIS/RMPA, or do not meet the purpose and need (**Table 1-2**). These issues and the rationale for not analyzing them further are provided below.

Table 1-2
Scoping Issues not Further Analyzed and the Rationale for not Analyzing Further

Issue	Rationale
How will the BLM define undue degradation?	This is out of scope. Undue degradation is defined in 43 CFR 3809.5.
Will any alternatives contain requirements or lease stipulations requiring emission control technologies?	This is out of scope. This SEIS/RMPA does not consider stipulations for fluid minerals leasing and development. Those are included in the 2015 Approved RMP/Record of Decision (ROD).
How will the BLM no surface occupancy waivers affect the effectiveness of Greater Sage-Grouse conservation measures?	This is out of scope. Oil and gas-related impacts were disclosed in the 2015 Proposed RMP/Final EIS.
Will the BLM complete additional lands with wilderness characteristics inventories during the SEIS/RMPA process? Will the BLM make lands with wilderness characteristics inventory forms publicly available?	This is out of scope. Lands with wilderness characteristics inventories were conducted as part of the RMP process. Inventory forms are available through the MCFO.
What management actions will be in the SEIS/RMPA for areas identified as possessing lands with wilderness characteristics?	This is out of scope. Management actions for lands with wilderness characteristics are identified in the 2015 Proposed RMP/Final EIS.
How will toxic air emissions be mitigated?	This is out of scope because it does not meet the purpose and need of the SEIS/RMPA.
How will the BLM differentiate air quality management between federal and state agencies?	This is out of scope, and it does not meet the purpose and need of the SEIS/RMPA. Analysis was included as part of the 2015 Proposed RMP/Final EIS.
How will air pollution affect regional air quality, and how will the BLM analyze criteria air pollutants?	This is out of scope because it does not meet the purpose and need of the SEIS/RMPA. Analysis was included as part of the 2015 Proposed RMP/Final EIS.

Issue	Rationale
Will the BLM offer any protections in lands with wilderness characteristics areas until the SEIS/RMPA is completed?	Lands with wilderness characteristics were considered in the multiple-use coal screen, and such lands were removed from further consideration for leasing; see **Appendix A**.
How will the BLM update the SEIS/RMPA to include descriptions and analyses of lands with wilderness characteristics in the planning area?	Lands with wilderness characteristics were considered in the multiple-use coal screen, and such lands were removed from further consideration for leasing; see **Appendix A**. Therefore, a detailed analysis of impacts is not needed because there would be no impacts on lands with wilderness characteristics.
How will noise from mineral development affect recreation in the planning area?	Recreation areas were considered in the multiple-use and unsuitability criteria coal screens and lands removed from further consideration for leasing. See **Appendix A**.
What types of conditions will the BLM use to reduce impacts from oil and gas development on resources in the planning area?	This is out of scope. This was considered in the 2015 Proposed RMP/Final EIS and does not meet the purpose and need of this SEIS/RMPA.
How will the BLM analyze potential impacts of hydraulic fracturing in the SEIS/RMPA?	This is out of scope. This was considered in the 2015 Proposed RMP/Final EIS and does not meet the purpose and need of this SEIS/RMPA.
What is the impact of fossil fuel development and use on public health and safety?	This is out of scope because it does not meet the purpose and need of the SEIS/RMPA. Analysis was included as part of the 2015 Proposed RMP/Final EIS.
What are the social effects of greenhouse gas emissions that result from fossil fuel development and use?	The social effects of climate change are disclosed in the 2015 Proposed RMP/Final EIS under pertinent resource and resource use sections. Impacts would not be substantially different from those disclosed in that EIS.
Which demographics are most vulnerable to climate-related effects that result from greenhouse gas emissions?	Environmental justice impacts were disclosed in the 2015 Proposed RMP/Final EIS. There has been ongoing public collaboration and outreach during this SEIS/RMPA process, including tribal consultation.
Will the SEIS/RMPA analyze the risk of "carbon lock-in"?	This is out of scope because it does not meet the purpose and need of the SEIS/RMPA.
What protections will be made to areas being proposed to be managed as an areas of critical environmental concern (ACECs) in the SEIS/RMPA?	ACECs were considered in the multiple-use coal screen and lands removed from further consideration for leasing. See **Appendix A**.
How will the BLM approach travel planning for this project?	The travel management areas, Hay Draw and Knowlton, were removed through the multiple-use coal screen (see **Appendix A**). Additional considerations for travel management are out of scope because they do not meet the purpose and need of this SEIS/RMPA. Analysis was included as part of the 2015 Proposed RMP/Final EIS.
Will the BLM inventory additional areas for consideration of meeting wild and scenic river (WSR) eligibility? Will the BLM add WSR inventory sheets to the SEIS/RMPA or make a stand-alone WSR report publicly available?	This is out of scope because it does not meet the purpose and need of this SEIS/RMPA. This was considered in the 2015 Proposed RMP/Final EIS.
Will the BLM analyze specific management actions for wilderness study areas (WSAs) that Congress has recently released from wilderness study?	This is out of scope. WSA management and analysis were included in the 2015 Proposed RMP/Final EIS.

Issue	Rationale
What is the projected monetized value of impacts from coal development (i.e., the social cost of carbon) in the planning area, and how do these relate to the value of the projected coal mining?	The BLM is not required to do a cost-benefit analysis in NEPA (40 CFR 1502.23). The BLM conducted an economic contribution analysis to analyze the potential economic output of forecasted coal development in the decision area (see **Chapter 3**, Economic Considerations).
Will the BLM analyze the economic resilience of communities in the planning area?	This is out of scope. The analysis acknowledges the relative importance of the coal industry in the context of the geographic area. However, the economic resilience is not germane to the analysis.

1.4.3 Resource Topics Not Carried Forward for Detailed Analysis

Table 1-3 lists the resources eliminated from further analysis and the rationale for elimination. In some cases, resources are not present in the decision area, so actions proposed in this SEIS/RMPA would not affect them. Through the coal screening process, some resources would be removed from the potential for coal development under Alternatives B and C either because they would be determined unacceptable for further consideration for leasing (Screen 3) or because they would be determined unsuitable for coal development without exception (Screen 2). In other cases, the action alternatives would not propose anything that would change the impacts disclosed in the 2015 Proposed RMP/Final EIS, so those resources are not carried forward for additional analysis in this SEIS/RMPA. In all cases, impacts under the No Action Alternative would not be substantially different from those described in the 2015 Proposed RMP/Final EIS[3] and are not carried forward further in this SEIS/RMPA.

Table 1-3
Resources Eliminated from Further Analysis and the Rationale

Resource	Rationale
Wild horses and burros	Not present in the decision area.
Wilderness areas	Not present in the decision area.
Wild and scenic rivers	Not present in the decision area.
Natural resource waters	Not present in the decision area.
Vegetation	No threatened or endangered plant species in the decision area. No change in impacts from the 2015 Proposed RMP/Final EIS for other vegetation resources.
Leasable minerals: fluids	Removed through the multiple-use coal screen; see **Appendix A**. The impacts on air resources required in the court's order are disclosed under **Section 3.3**, Air Resources, Including Greenhouse Gasses and Climate Change.
Areas of critical environmental concern	Removed through the multiple-use coal screen; see **Appendix A**.

[3] Since 2015, the BLM has updated the reasonably foreseeable development (RFD) scenario for coal from what was analyzed in that EIS based on current market conditions. Under the No Action Alternative in this SEIS/RMPA, impacts would be slightly reduced from what was disclosed in the proposed plan in the 2015 Proposed RMP/Final EIS because the RFD scenario is forecasted to be lower than what was forecasted in 2015.

Resource	Rationale
National trails	The Lewis and Clark National Historic Trail is present within the decision area; however, as a special recreation management area, it was removed during the multiple-use coal screen. The cultural component is also unsuitable without exception under criterion 7.
Wilderness study areas	WSAs were removed through the multiple-use coal screen; see **Appendix A**.
Recreation and visitor services	Recreation areas were removed through the multiple-use coal screen; see **Appendix A**.
Sport fisheries	Sport fisheries were removed through the multiple-use coal screen; see **Appendix A**.
Visual resources	Visual Resource Management Class I areas are unsuitable without exception (criterion 5); see **Appendix A**. Otherwise, no change in impacts from the 2015 Proposed RMP/Final EIS.
Travel management	Travel management areas were removed through the multiple-use coal screen; see **Appendix A**.
Perennial streams, riparian areas, and wetland areas	These areas were removed through the multiple-use coal screen; see **Appendix A**.
100-year floodplains	100-year floodplains are unsuitable without exception under criterion 18; see **Appendix A**.
Alluvial valley floors	Alluvial valley floors are unsuitable without exception under criterion 19; see **Appendix A**.
Paleontological resources	No change in impacts from the 2015 Proposed RMP/Final EIS.
Soil resources	No change in impacts from the 2015 Proposed RMP/Final EIS.
Wildland fire management	No change in impacts from the 2015 Proposed RMP/Final EIS.
Livestock grazing	No change in impacts from the 2015 Proposed RMP/Final EIS.
Forest and woodland products	No change in impacts from the 2015 Proposed RMP/Final EIS.
Locatable minerals	No change in impacts from the 2015 Proposed RMP/Final EIS.
Mineral materials	No change in impacts from the 2015 Proposed RMP/Final EIS.
Nonenergy leasable minerals	No change in impacts from the 2015 Proposed RMP/Final EIS.
Renewable energy	No change in impacts from the 2015 Proposed RMP/Final EIS.
Backcountry byways	No change in impacts from the 2015 Proposed RMP/Final EIS.

1.5 PLANNING CRITERIA AND REGULATORY CONSTRAINTS

1.5.1 Planning Criteria

Planning criteria guide development of the SEIS/RMPA by defining the decision space. 43 CFR 1610.4-2(b) states that the "Planning criteria will generally be based upon applicable law, Director and State Director guidance, the results of public participation, and coordination with any cooperating agencies and other Federal agencies, State and local governments, and federally recognized Indian tribes."

Planning criteria represent the overarching factors used to resolve issues and to develop alternatives. The planning criteria considered in the development of this document are as follows:

- The SEIS/RMPA complies with NEPA, FLPMA, and other applicable laws, executive orders, regulations, and policy.

- Lands covered in the SEIS/RMPA are federal lands, including split estate,[4] managed by the BLM. No decisions will be made relative to non-BLM-administered lands.
- The SEIS/RMPA makes land use planning decisions to allocate lands acceptable for further consideration for coal leasing.
- The SEIS/RMPA uses a collaborative and multi-jurisdictional approach to determine the desired future condition of public lands.
- Decisions in the plan are compatible with existing plans and policies of adjacent local, state, federal, and tribal agencies, as long as the decisions are consistent with the purposes, policies, and programs of federal law and regulations applicable to public lands.
- The SEIS/RMPA recognizes valid existing rights.
- The SEIS/RMPA does not change existing planning decisions that are still valid.

This proposed amendment is not intended to be a full RMP revision; rather, it is to provide additional analysis for land use planning as it pertains to downstream emissions and other resources as a result of updating the coal screens. It is also to make plan-level decisions regarding the availability of lands for further consideration for leasing and the unsuitability of lands for all or certain stipulated methods of surface coal mining, consistent with the court's order. Due to the limited focus of this planning analysis, the BLM did not address decisions that would normally be considered in a full RMP revision.

All data used in this plan are best estimates for comparative purposes only. At the site-specific level, surveys and precision measures will be taken to improve accuracy.

1.5.2 Regulatory Constraints

Coal Screening Process

The BLM's authority to manage federal coal comes from the Mineral Leasing Act of 1920, as amended; the Mineral Leasing Act on Acquired Lands of 1947, as amended; and the FLPMA. Regulations developed from these statutes are in 43 CFR 3000 and 3400; these regulations guide the BLM coal program management, setting requirements for land use planning, leasing, and post-lease maintenance.

Coal planning regulations in 43 CFR 3420.1–4 require the BLM to identify federal lands acceptable for further consideration for leasing. These lands are analyzed in the land use planning process. The four coal screens are applied as follows:

1. Identification of coal with development potential—Lands determined to have development potential are considered acceptable for further consideration for leasing and are applied to the remaining coal screens. Lands determined to not have development potential are eliminated from further consideration for leasing. This step identifies the acres of recoverable coal.

[4] Split estate is subsurface federal coal overlain by state or private surface lands within the decision area.

2. Application of unsuitability criteria—Lands with coal potential are assessed with procedures outlined in 43 CFR 3461. Lands within coal potential may be eliminated from further consideration for leasing if determined to be unsuitable without exception pursuant to Section 522(b) of the Surface Mining Control and Reclamation Act. In accordance with 43 CFR 3461.2-1, the BLM could, based on additional site-specific surveys or changes in resource conditions, change the unsuitability determination of a given tract at the activity planning stage.
3. Multiple-use conflict analysis—43 CFR 3420.1-4e(3) states that "multiple land use decisions shall be made which may eliminate additional coal deposits from further consideration for leasing, to protect resource values of a locally important or unique nature not included in the unsuitability criteria." Multiple-use coal screen criteria may include possible oil and gas development, and soil, forest, wildlife, recreation, agriculture, and watershed resources. Lands within coal potential may be eliminated from further consideration for leasing where multiple uses conflict.
4. Surface owner consultation—This screen requires the BLM to consult with qualified surface owners whose land overlies federal coal with development potential. The BLM asks the owners for their preference for or against offering the coal deposits under their land for lease. Lands within coal potential may be eliminated from further consideration for leasing based on qualified surface owner preference.

The acreage of recoverable coal available for leasing is calculated by applying all four coal screens. Federal lands made acceptable for coal leasing and development through coal screening in the MCFO are the subject of this SEIS/RMPA analysis; results of the coal screening process are in **Appendix A**.

Coal and Mineral Leasing Management Specific Laws, Regulations, and Policies

The BLM has several laws, regulations, and policies that guide its management of federal coal, as follows:

- The Mineral Leasing Act of 1920, as amended
- The Mineral Leasing Act for Acquired Land of 1947, as amended
- Federal Coal Leasing Amendments Act of 1976
- FLPMA
- Surface Mining Control and Reclamation Act of 1977
- 43 CFR 3000 and 3400

Relationship to Other Federal Laws, Regulations, Policies, and Programs

Numerous federal and state laws and applicable regulations, policies, and actions affect the alternatives analyzed in the SEIS/RMPA.

FLPMA is the primary authority for BLM's management of public lands and provides the policy by which the BLM manages federal coal. The BLM MCFO will make decisions for coal acceptable for further consideration for leasing under this SEIS/RMPA and is required to follow the mandates of FLPMA when making those decisions.

The land use decisions made in this SEIS/RMPA require analysis under NEPA. The BLM MCFO will analyze the impacts of the coal leasing decisions on the other resources identified in the decision area, including air quality, climate change, economic considerations, and the other resources identified in **Table 1-1**.

See the 2015 Proposed RMP/Final EIS (BLM 2015a) for the full list of additional laws, regulations, policies, and programs that are relevant to this analysis (Chapter 1, beginning on page 1-12).

1.6 COLLABORATION

The BLM is engaging in ongoing collaboration with federal, tribal, state, and local governments as part of this planning process. This collaboration includes government-to-government consultation with affected Native American tribes, the participation of cooperating agencies, and consultation with regulatory agencies, as required by law. **Chapter 4**, Coordination and Consultation, provides more information about the involvement of these stakeholders.

1.7 RELATIONSHIP TO STATE AND LOCAL PLANS

In developing the SEIS/RMPA, the BLM has considered plans of other state, local, and federal agencies that are relevant and kept consistency with or was complementary to these plans, as required by the consistency provisions of FLPMA (43 United States Code [USC] 1712[c][9]) and the BLM's planning regulations at 43 CFR 1610.3–2. The plans considered during this supplemental analysis are consistent with and are listed in the 2015 Proposed RMP/Final EIS (pages 1-16 and 1-17).

1.8 CHANGES BETWEEN DRAFT AND FINAL SUPPLEMENTAL EISS

This section describes substantive changes made between the draft and final SEIS based on public comments. In addition to the changes listed below, editorial clarifications were made throughout the SEIS.

Chapter 1

- Clarified the use of the term *recoverable coal* as it applies to this SEIS.

Chapter 2

- Updated surface owner response calculations. The acres reported in Table 2-2, Table 2-3, and Appendix A of the Draft SEIS/RMPA did not account for the application of Screen 1; however, Figure A-22 of the Draft SEIS/RMPA was properly displayed. The acres should have been reported as 203,773 instead of 489,619. In addition to correcting this in the Final SEIS/RMPA, the surface owner responses received between March 5 and August 15, 2019, were also included in the surface owner consultation screen in the Final SEIS/Proposed RMPA. This resulted in 236,631 acres being considered unacceptable for further consideration for leasing under the surface owner consultation screen in the Final SEIS/Proposed RMPA.
- Updated acreages for Alternatives B and C based on reapplying the coal screens with updated data (e.g., updated resource survey data and surface ownership responses).

- Updated calculations for the existing oil and gas units criterion of the multiple-use screen. The reported acres in the Draft SEIS/RMPA did not account for the application of Screen 1. Figure A-17 of the Draft SEIS/RMPA was properly displayed.
- Added text to **Section 2.2.3** to further describe the rationale for considering but eliminating from detailed analysis an alternative that considers no new leasing.

Chapter 3

- Updated acreages throughout for Alternatives B and C based on reapplying the coal screens with updated data (e.g., updated resource survey data and surface ownership responses).
- Added text to describe that the RFD scenario did not involve modeling because needed information was obtained directly from operators, and the RFD scenario accounts for projected closures at the Colstrip Power Plant and closure of the Lewis and Clark Power Plant.
- Combined special status species and fish and wildlife (Sections 3.5 and 3.6 of the Draft SEIS) into a single section titled Wildlife, Including Aquatic and Special Status Species (**Section 3.5**) to reduce redundancy between the sections. Added explicit calculations by species for each of the unsuitability criteria and multiple-use criteria related to wildlife.

Chapter 4

- Updated information related to tribal consultation and State Historic Preservation Office (SHPO) consultation.

Appendix A

- Updated surface owner response calculations. The acres reported in Table 2-2, Table 2-3, and Appendix A of the Draft SEIS/RMPA did not account for the application of Screen 1; however, Figure A-22 of the Draft SEIS/RMPA was properly displayed. The acres should have been reported as 203,773 instead of 489,619. In addition to correcting this in the Final SEIS/Proposed RMPA, the surface owner responses received between March 5 and August 15, 2019, were also included in the surface owner consultation screen in the Final SEIS/Proposed RMPA. This resulted in 236,631 acres being considered unacceptable for further consideration for leasing under the surface owner consultation screen in the Final SEIS/Proposed RMPA.
- Updated acreages for Alternatives B and C based on reapplying the coal screens with updated data (e.g., updated resource survey data and surface ownership responses).
- Updated calculations for the existing oil and gas units criterion of the multiple-use screen. The reported acres in the Draft SEIS/RMPA did not account for the application of Screen 1. Figure A-17 of the Draft SEIS/RMPA was properly displayed.
- Added descriptive information related to unsuitability and multiple-use criterion considerations.

Appendix C

- Added text to clarify that the RFD scenario does not consider future leasing in the decision area beyond the already approved leases and existing lease applications during the life of the plan. In other words, this RFD scenario is limited to the approved leases and existing lease applications.
- Added text to describe that the RFD scenario did not involve modeling because needed information was obtained directly from operators, and the RFD scenario accounts for projected closures at the Colstrip Power Plant and closure of the Lewis and Clark Power Plant.

Appendix D

- Updated text summarizing the Wright Area Environmental Assessment based on the final Environmental Assessment.

Appendix E

- Added **Appendix E**, which contains responses to substantive comments received from the public on the Draft SEIS/RMPA.

Chapter 2. Alternatives

2.1 INTRODUCTION

The BLM MCFO developed the two action alternatives considered in this SEIS/RMPA in coordination with cooperating agencies, interested stakeholders (including private landowners), county and state governments, tribal governments, and comments received from the general public during the public scoping period.

The SEIS/RMPA alternatives focus solely on coal leasing in response to the court's order. The range of alternatives meets the purpose and need for the SEIS/RMPA and responds to issues raised during scoping (see **Section 1.4**, and **Section 4.3**; and the BLM Miles City Field Office RMP SEIS Scoping Report). The alternatives are described in detail in **Sections 2.2.3**, **2.2.4**, and **2.2.5**.

2.2 ALTERNATIVES DEVELOPMENT

After the public scoping period closed on December 28, 2018, the BLM MCFO began developing alternatives. The BLM MCFO developed two action alternatives. This was based on public input, the court's order, updated coal screening, and the defined purpose and need for the SEIS/RMPA.

A summary of lands acceptable for further consideration for coal leasing and development for the action alternatives is provided in **Tables 2-1**, **2-2**, and **2-3.**

2.2.1 BLM Coal Screening Process

The BLM performed coal screens 1–4 (see **Chapter 1**, **Section 1.5.2**, page 1-9, and **Appendix A**) in order to formulate the action alternatives. In addition, the BLM reviewed the *Minerals Appendix* of the 2015 Proposed RMP/Final EIS (BLM 2015a), decisions made in the 2015 Approved RMP/Record of Decision (which precluded coal development; BLM 2015b), new scientific data, and new GIS data. The BLM evaluated issues identified through internal and public scoping (see **Section 1.4**, and **Section 4.3**; and the BLM Miles City Field Office RMP SEIS Scoping Report). In accordance with 43 CFR 3461.2-1, the BLM could, based on additional site-specific surveys or changes in resource conditions, change the unsuitability determination for screen 2 unsuitability of a given tract at the activity planning stage.

2.2.2 Alternative A (No Action Alternative)

For the No Action Alternative, the BLM brought forward management decisions from the coal screens performed for the Powder River and Big Dry RMPs into the 2015 Proposed RMP/Final EIS. The coal screens from the Powder River and Big Dry RMPs are included in the *Minerals Appendix* to the 2015 Proposed RMP/Final EIS.

Figure 2-1 shows the coal acceptability geospatial results from the 2015 Proposed RMP/Final EIS for the No Action Alternative. **Table 2-1** depicts the overall coal acceptability results for Alternative A.

Table 2-1
Coal Acceptability Results for Alternative A

Acceptable (acres)	Unacceptable (acres)
1,581,240	325,430

Source: BLM 2015a

2.2.3 Alternative B (BLM Proposed Plan Amendment)

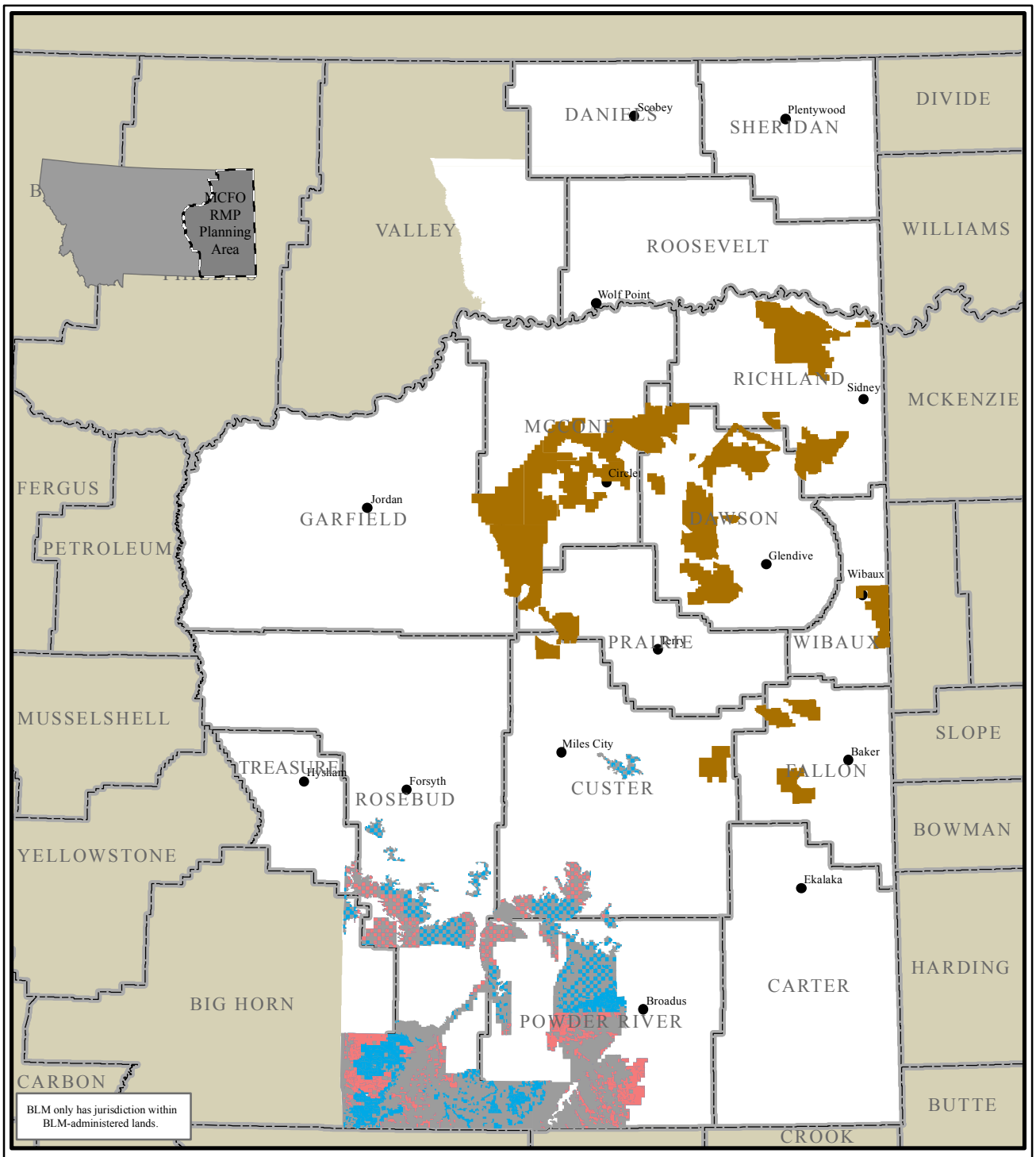
For Alternative B, new coal screens were applied to determine lands acceptable for further consideration for coal leasing. **Appendix A** includes the new detailed coal screens and their supporting data. An air quality criterion was considered as a multiple-use coal screen under this alternative.

Alternative B considers a criterion for maintaining air quality standards as part of the multiple-use screen; however, existing data and modeling done for the 2015 Proposed RMP/Final EIS showed no air quality standards were exceeded based on the national ambient air quality standards under the Clean Air Act. Therefore, no resulting geographic area of land was unacceptable for further consideration for coal leasing based on air resources.

In addition, this alternative removes lands as unacceptable for further consideration for leasing under the multiple-use screen that considers conflicts with active oil and gas wells; active oil and gas units; perennial, riparian, and wetland resources; conservation easements; recreation areas; travel management areas; sport fishing reservoirs; areas of critical environmental concern; and cultural viewsheds.

Figure 2-2 shows the geospatial results of the four coal screens for Alternative B. **Table 2-2** depicts the coal screening results.

For unsuitability criterion 15, Habitat for Species of High Interest to the State, the BLM would apply a stipulation to coal development as detailed in **Appendix A**.



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Projected Coordinate System: NAD 1983 Albers
Geographic Coordinate System: GCS North American 1983
Datum: North American 1983

Big Dry Areas Suitable for Further Consideration

Coal Areas Suitable for Further Consideration and Pending Further Study

Coal Areas Suitable for Further Consideration

Coal Development Potential

0 5 10 20 30 40 Miles

Figure 2-1 Alternative A Coal Areas Suitable for Further Consideration for Leasing

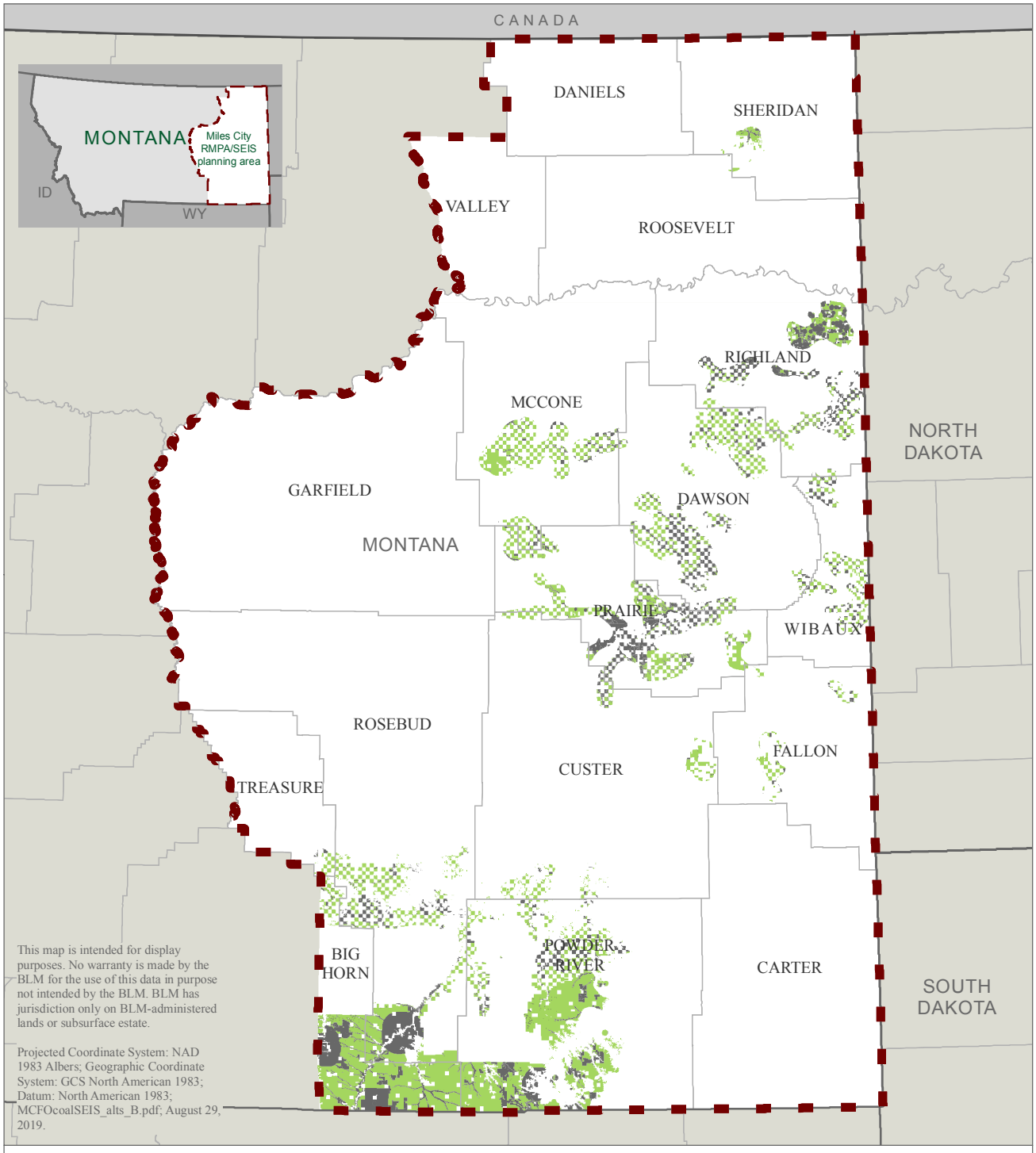


Figure 2-2
Alternative B: Areas Acceptable for Further Consideration for Leasing

Table 2-2
Coal Screening Results for Alternative B

Coal Screen[1]	Total (acres)[2]
Coal potential (Screen 1)	1,744,800
Unsuitable for all methods of coal mining without exception (Screen 2)	190,590
Unsuitable for all or certain stipulated methods of coal mining with exception/stipulation (Screen 2)	1,259,270
Unacceptable for further consideration for leasing (Screen 3)	193,010
Unacceptable for further consideration for leasing (Screen 4)	236,630
Total Acceptable	***1,214,380***
Total Unacceptable	***530,420***

[1] See **Appendix A** for full coal screening results.
[2] There is overlap between the coal screens; acres are not additive.

2.2.4 Alternative C

Alternative C uses the same coal screen applications for Screen 1 (coal potential), 2 (unsuitability), and 4 (landowner consultation) as Alternative B (**Appendix A**). For the multiple-use coal screen (Screen 3), in addition to the listed criterion in Alternative B, Alternative C applies an air resource criterion based on greenhouse gas emissions that would result from additional transportation to deliver coal to the existing infrastructure. The air resource criterion limits coal development to an 8-mile infrastructure area around the four existing mines in the decision area (Spring Creek Mine Complex, Rosebud Mine, Decker Mine, and Savage Mine). The 8-mile area encompasses existing transportation infrastructure (for example, haul roads, conveyor belts, and railroad loops) associated with load-out facilities at the existing mines.

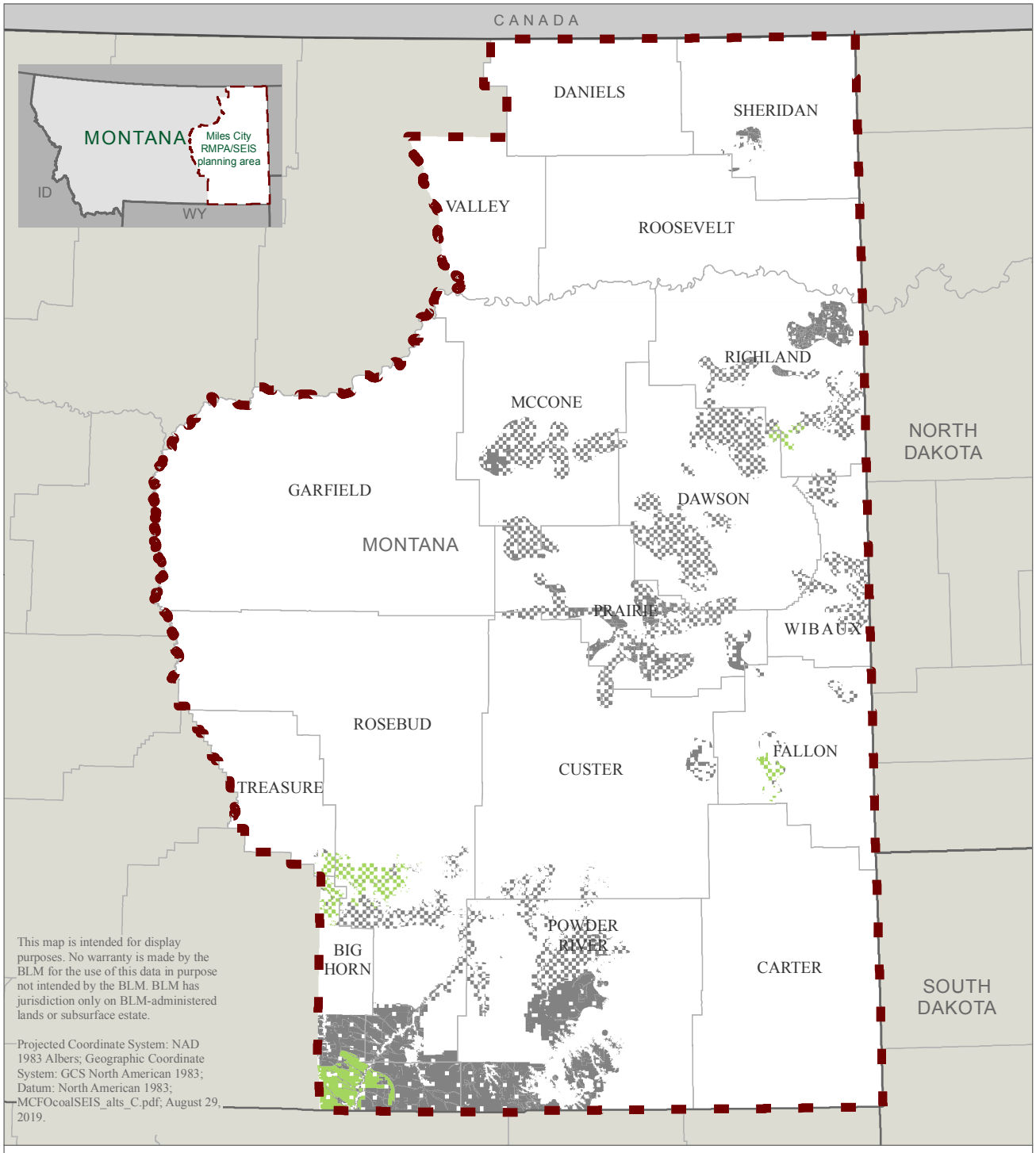
Figure 2-3 shows the geospatial results of the four coal screens for Alternative C. **Table 2-3** depicts the coal screening results.

For unsuitability criterion 15, Habitat for Species of High Interest to the State, the BLM would apply the same stipulation to coal development as described for Alternative B.

Table 2-3
Coal Screening Results for Alternative C

Coal Screen[1]	Total (acres)[2]
Coal potential (Screen 1)	1,744,800
Unsuitable for all methods of coal mining without exception (Screen 2)	190,590
Unsuitable for all or certain stipulated methods of coal mining with exception/stipulation (Screen 2)	1,259,270
Unacceptable for further consideration for leasing (Screen 3)	1,564,330
Unacceptable for further consideration for leasing (Screen 4)	236,630
Total Acceptable	***158,400***
Total Unacceptable	***1,586,400***

[1] See **Appendix A** for full coal screening results.
[2] There is overlap between the coal screens; acres are not additive.



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1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure 2-3
Alternative C: Areas Acceptable for Further Consideration for Leasing

Unacceptable
Acceptable

2.2.5 Alternatives Considered but Eliminated from Further Study

NEPA requires federal agencies to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any that were not developed in detail (40 CFR 1502.14). Through comments on the proposed action, the public suggested alternative methods for achieving the purpose and need. Some of these alternatives were outside the scope of responding to the court's order. These suggested alternatives were considered but dismissed from detailed consideration for the reasons summarized below.

No Leasing Alternative

During scoping and comments on the Draft SEIS/RMPA, several commenters suggested analyzing an alternative for no future leasing of coal. Closing the decision area to any future leasing of federal coal, even in areas where there are no identified resource conflicts, was considered but not brought forward for further analysis. The primary land use plan-level decision to be made regarding coal is identifying areas that are acceptable for further consideration for coal leasing and those that are not acceptable (BLM Land Use Planning Handbook H-1601-1, Appendix C).

Although a land use planning-level decision can be made that precludes coal development throughout the planning area, it does so by making areas unacceptable for further consideration of leasing; the process undertaken to arrive at this land use plan allocation must be consistent with the federal regulations. Namely, the BLM is required to go through the coal screening process outlined in 43 CFR 3420 et. seq. to arrive at its decision on coal allocations. As part of this process, the multiple-use screen is the screen used to remove lands that would conflict with resources of high value to the public from further consideration for coal leasing.

Alternatives B and C show a reduction in lands acceptable for further consideration of leasing (**Tables 2-1**, **2-2**, and **2-3**); Alternative C makes unacceptable nearly 5 times more acres compared with Alternative A and 3 times more acres compared with Alternative B, for the specific purpose of addressing greenhouse gas emissions through the coal screening process. Once the land use plan-level decision has identified areas acceptable or unacceptable for further consideration of leasing, the decision whether to lease parcels is made at the application level; this is a discretionary action and the no-leasing/no-action alternative would be considered at this stage in the NEPA process.

The forecasted production in the RFD scenario is derived from contract and future estimates provided by the operators and existing lease applications. Based on this information, the BLM determined that there would be no additional leasing; therefore, the RFD scenario is limited to the approved leases and existing lease applications beyond the already approved leases and existing lease applications. Any future leasing beyond the current leases and existing lease applications considered in this RFD scenario would exceed the scope of impacts analyzed in this RMP amendment; this would require additional NEPA analysis. The policy detailed in 43 CFR 3420.1–4e explains the selectivity of resources that should drive such determinations of unacceptability. This is consistent with BLM Handbook 3420, which directs the BLM to prioritize energy development to support competitive energy markets and national energy objectives. The BLM's authorities are clear in their direction that coal unacceptability for leasing is based on protecting specific, high-value resources and does not consider unspecific resource concerns.

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Chapter 3.
Affected Environment and Environmental Consequences

3.1 INTRODUCTION

This chapter describes the existing biological, physical, and socioeconomic characteristics of the decision area, including human uses that could be affected, and it evaluates the impacts or effects of implementing the proposed alternatives. The 2015 Proposed RMP/Final EIS described the baseline conditions in the decision area (BLM 2015a; Chapter 3: *Affected Environment*). Because the 2015 Proposed RMP/Final EIS describes the baseline conditions in detail, this chapter incorporates those conditions by reference and provides updated descriptions of those resources that have new or updated information. **Chapter 1** includes a list of those resources considered but eliminated from further analysis.

3.2 METHODS AND ASSUMPTIONS

3.2.1 Analytical Assumptions

Several assumptions were made to facilitate the analysis of potential effects and to ensure that the analysis adhered to the federal district court's order. The majority of resources will apply assumptions identified in the 2015 Proposed RMP/Final EIS. Below are general assumptions that apply to all resources:

- Planning issues identified in **Chapter 1** and the court's order provide the focus for the scope of effects analyses in this chapter.
- All resources will use baseline data from the 2015 Proposed RMP/Final EIS unless updated information is identified.
- Unless otherwise indicated, most impacts analyses assume a 20-year time horizon.
- The BLM RFD scenario forecasts approximately 775 million tons for mining in the MCFO, of which approximately 450 million tons are federal coal over the 20-year planning period within three counties (see **Appendix C**).
- The BLM forecasts a total of approximately 9,730 acres of surface disturbance for coal development in the next 20 years based on current leases and lease

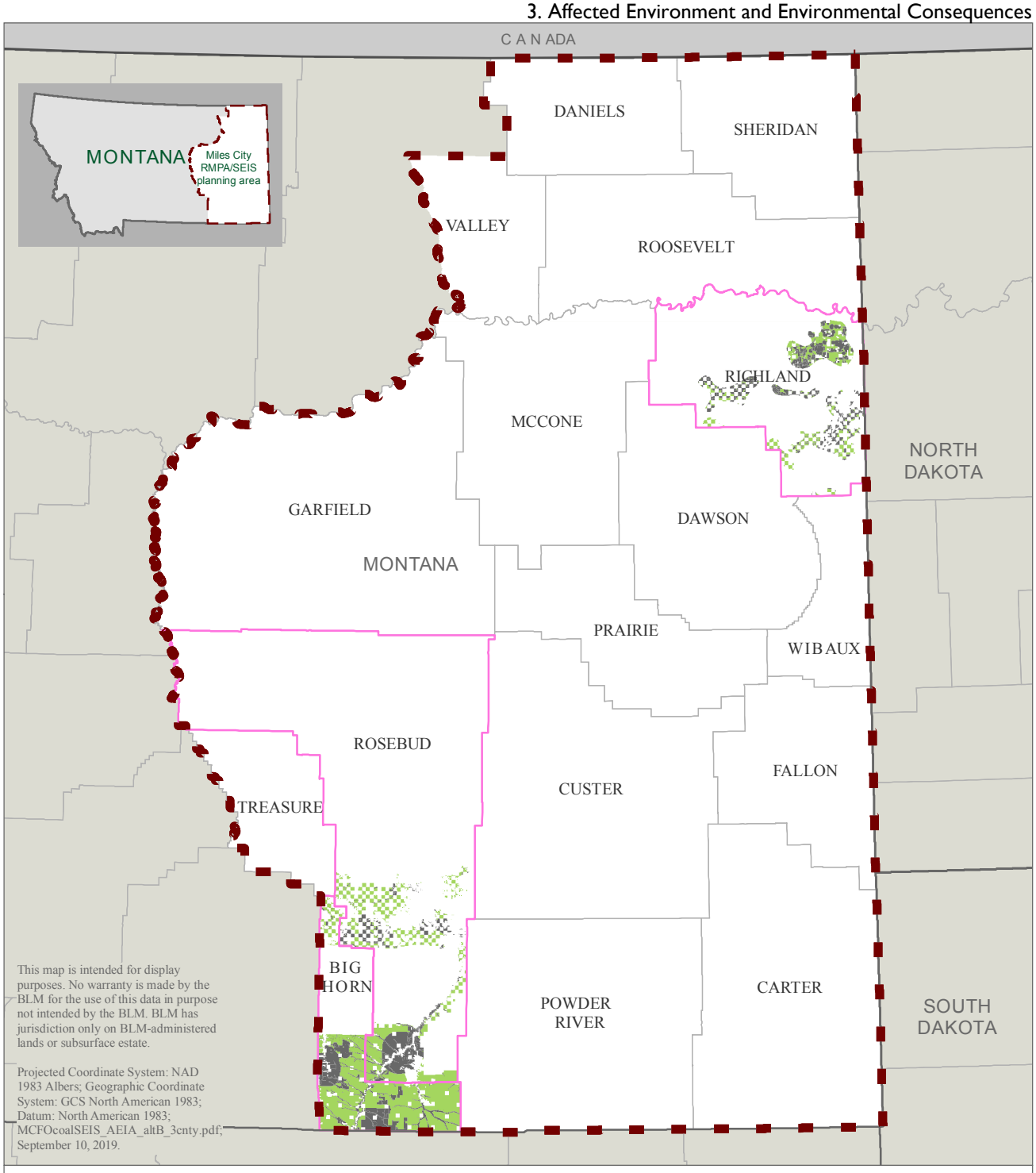
applications, as identified by operators and detailed in the RFD scenario, **Appendix C**. Of this total, approximately 5,640 acres would be attributed to mining of federal coal. All mining-related disturbances would be limited to the three-county area of Big Horn, Richland, and Rosebud Counties. This level of disturbance would be the same under all alternatives, including the No Action Alternative (Alternative A). Because the RFD scenario limits the area of development to the three aforementioned counties, any lease application outside the three-county area during the life of this RMPA would require additional NEPA analysis.

- Because of the RFD projection previously described, the impact analysis area for Alternatives B and C is the lands acceptable for further consideration for leasing within the three-county area of Big Horn, Richland, and Rosebud Counties (see **Figures 3-1** and **3-2**); it does not include the entire planning area from the 2015 Proposed RMP/Final EIS. For Alternative A, the impact analysis area is the area acceptable for further consideration for coal leasing described in the 2015 Proposed RMP/Final EIS (BLM 2015a).
- The BLM used best available data at the time of application of coal screens for this effort. In accordance with 43 CFR 3461.2-1, the BLM could, based on additional site-specific surveys or changes in resource conditions, change the determination of Screen 2 (unsuitability) of a given tract at the activity planning stage, without amending the decisions in this RMPA.
- Assumptions about specific resources, included below, are generally the same as those in the 2015 Proposed RMP/Final EIS. In some cases, they have been updated for clarity.
- Acre figures and other numbers used in the analysis are approximate projections for comparison and analytical purposes only.

3.2.2 Reasonably Foreseeable Development Scenario

The BLM MCFO updated the RFD scenario from the 2015 Proposed RMP/Final EIS. The revised RFD scenario represents forecasted coal production from five surface mining operations during the 2019–2038 life of the SEIS/RMPA. Four operations (Spring Creek Mine Complex, Rosebud Mine, Decker Mine, and Savage Mine) are located in the decision area. One surface mine operation is located outside the decision area, but within the MCFO planning area (Absaloka Mine) because the coal is not federal coal administered by the BLM. There are no underground mines in the planning area and, based on the geology and economics, there are no reasonably foreseeable opportunities for underground mining in the planning area.

Because these five mines are dispersed throughout the field office and due to the fragmented nature of the intermingled landownership pattern, the forecasted production of the MCFO planning area reflects production from state, federal, and private coal. The forecasted production is derived from contract and future estimates provided by the operators and existing lease applications; therefore, no modeling projections were needed to estimate forecasted production. This RFD scenario accounts for projected closures at the Colstrip Power Plant and closure of the Lewis and Clark Power Plant.


CANADA
MONTANA
Miles City RMPA/SEIS planning area
DANIELS
SHERIDAN
VALLEY
ROOSEVELT
RICHLAND
MCCONE
NORTH DAKOTA
GARFIELD
DAWSON
MONTANA
PRAIRIE
WIBAUX
ROSEBUD
FALLON
CUSTER
TREASURE
BIG HORN
POWDER RIVER
CARTER
SOUTH DAKOTA
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Projected Coordinate System: NAD 1983 Albers; Geographic Coordinate System: GCS North American 1983; Datum: North American 1983; MCFOcoalSEIS_AEIA_altB_3cnty.pdf; September 10, 2019.
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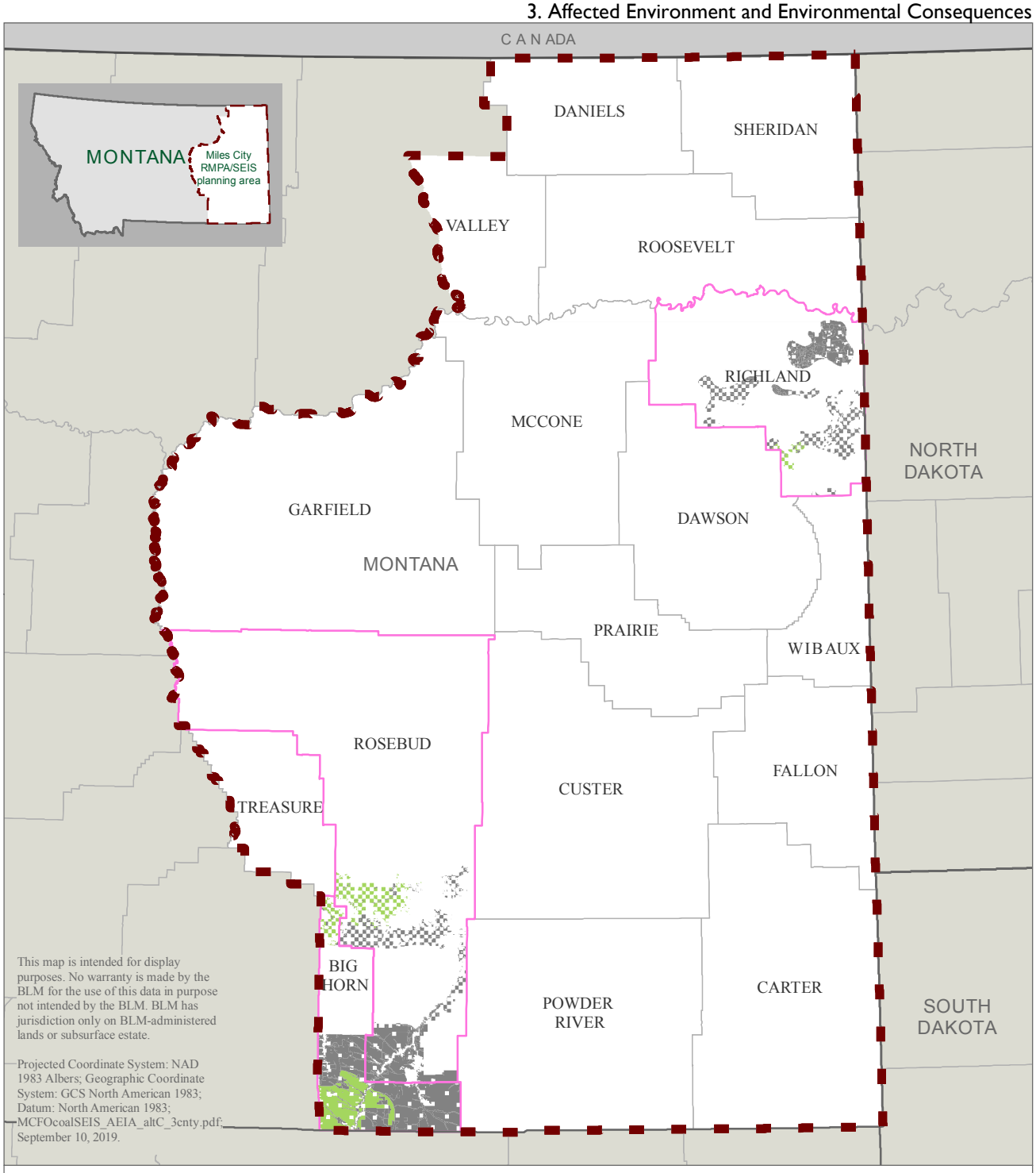
1 inch = 39.3 miles
0 5 10 20 30 Miles
Figure 3-1
Alternative B:
Impact Analysis Area
Unacceptable
Acceptable
Impact analysis area



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1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure 3-2
Alternative C:
Impact Analysis Area

- Unacceptable
- Acceptable
- Impact analysis area

The total forecasted production in the MCFO planning area is 775 million tons over the 20-year planning period. Approximately 450 million tons are from federal coal.

The RFD scenario forecasts that approximately 9,730 acres would be disturbed over the 20-year planning period while mining the forecasted 775 million tons of coal. The disturbance forecasted to mine federal coal would be proportional and equals approximately 5,640 acres.

The updated RFD scenario and forecast for coal production on federal coal over the 20-year planning period (approximately 450 million tons and 5,640 acres of surface disturbance) will be used for all alternatives, including the No Action Alternative. At this scale of analysis, it is unknown where the disturbance would occur, but it would be limited to the three-county area of Big Horn, Richland, and Rosebud Counties near existing mines. See **Appendix C** for further information on the RFD scenario.

The RFD scenario is the same under all alternatives, including the No Action Alternative, because the RFD scenario is limited to the approved leases and existing lease applications and the geographic scope for each alternative includes the areas forecasted for development.

3.2.3 Types of Effects

The analysis considers direct, indirect, and cumulative effects, consistent with direction at 40 CFR 1502.16.

- Direct effects are caused by an action or by implementation of an alternative and occur at the same time and place as that action or implementation. For example, for the action of building a road, a direct adverse effect is surface disturbance. Surface disturbance is the effect of heavy equipment (the cause) removing existing vegetation, wildlife habitat, and topsoil as it grades the road location.
- Indirect effects also result from an action or implementation of an alternative, but usually occur later in time or removed in distance from the action or implementation. For the action of building a road, an indirect effect could occur days after the surface is disturbed and some distance from the disturbance. Heavy precipitation following the removal of vegetation and disturbance of the ground surface could erode soil and transport sediment into streams. This effect on stream-water quality would be considered indirect.
- Cumulative effects result from individually minor but collectively significant actions over time. A cumulative effect is the effect on the environment that results from the incremental effect of the federal action when added to other past, present, and reasonably foreseeable future actions, federal and nonfederal.

3.2.4 Cumulative Impacts

Cumulative Analysis Methodology

Cumulative impacts are effects on the environment that result from implementing any of the action alternatives, in combination with other actions outside the scope of this SEIS/RMPA. CEQ regulations (CEQ 1997) require a cumulative impact analysis because environmental conditions result from many different factors that act together. The total effect of any single action cannot

be determined by considering it in isolation; it must be determined by considering the likely result of that action in conjunction with many other actions.

Past, Present, and Reasonably Foreseeable Future Actions

Evaluating potential impacts includes considering incremental impacts that could occur from the alternatives, as well as impacts from past, present, and reasonably foreseeable future actions. The decision area is fully contained within the area determined acceptable for further consideration for coal leasing in the 2015 Proposed RMP/Final EIS (BLM 2015a). See the 2015 Proposed RMP/Final EIS (BLM 2015a; *Cumulative Impacts,* pages 4-3 through 4-4) for a discussion of cumulative impact analysis methodology.

3.3 AIR RESOURCES, INCLUDING GREENHOUSE GASES AND CLIMATE CHANGE

The air resources analysis for the 2015 Proposed RMP/Final EIS (BLM 2015a) included air quality, air quality-related values such as visibility and deposition, and greenhouse gases and climate change. The air analysis for this SEIS/RMPA evaluates the potential impacts from management actions being considered in response to the court order issued by the US District Court (case CV16-21-GF-BMM) as amended March 26, 2018. The air quality and air quality-related values analyses contained in the 2015 Proposed RMPA/Final EIS were upheld and were not the subject of the court order; therefore, the air resource analysis here responds to the court order's direction to supplement the 2015 Proposed RMP/Final EIS analysis to evaluate the environmental consequences of the downstream combustion of coal, oil, and gas open to potential development (claim #3), justify the use of global warming potential (GWP) time horizons, and explain the evolving science in this area (claim #5).

3.3.1 Affected Environment

This section incorporates by reference the affected environment described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Climate – Affected Environment,* pages 3-2 through 3-4; and *Climate Change – Affected Environment*, page 3-4 through 3-12). More recent information as it pertains to the decisions for this SEIS/RMPA is included below.

The Intergovernmental Panel on Climate Change (IPCC) describes climate change as "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcing such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use" (IPCC 2013).

The IPCC states: "Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased" (IPCC 2013). The global average surface temperature has increased approximately 1.5 degrees Fahrenheit (°F) from 1880 to 2012 (IPCC 2013). Warming has occurred on land surfaces, oceans, and other water bodies. It has also occurred in the troposphere, which is the lowest layer of the earth's atmosphere ranging from 4 to 12 miles above the surface within which all the weather phenomena we experience on a daily basis occur.

Current ongoing global climate change is caused, in part, by the atmospheric buildup of greenhouse gases (GHGs), which may persist for decades or even centuries. Although largely invisible to the short wavelength incoming solar radiation that heats the earth's surface, GHGs absorb a portion of the outgoing long wavelength infrared heat radiated back from the surface, preventing it from escaping out into space. As a result, the buildup of GHGs such as carbon dioxide, methane, and nitrous oxide since the start of the industrial revolution has increased the global mean temperature and begun to alter the earth's climate in complex ways.

This section analyzes the three main GHGs (carbon dioxide, nitrous oxide, and methane) associated with the production, transportation, and downstream combustion of coal, oil, and gas over the life of the SEIS/RMPA. The analysis responds to the GHG and climate change-related issues identified in the court order (see **Chapter 1**, Purpose and Need) and issues identified through scoping (see **Tables 1-1** and **1-2**).

The method the BLM used to supplement the GHG and climate change analysis is described below. **Section 2.2**, Alternatives Development, addresses coal screening and consideration of climate change impacts, which the BLM used to make a reasoned decision on the amount of recoverable coal made available in the SEIS/RMPA (claim #1).

Different GHGs have different atmospheric lifetimes. Some, such as methane (CH_4), react in the atmosphere relatively quickly (on the order of 12 years; see EPA 2018a); others, such as carbon dioxide (CO_2), typically last for hundreds of years or longer. GHGs also vary with respect to the amount of outgoing radiation absorbed by each gas molecule relative to the amount of incoming radiation it allows to pass through (i.e., its level of radiative forcing). A molecule of nitrous oxide (N_2O) is far more effective at absorbing outgoing radiation than a molecule of CO_2. The impact of a given GHG species on global warming depends both on its radiative forcing and how long it lasts in the atmosphere.

Climate scientists have calculated a GWP for each GHG that accounts for these effects. GWPs are calculated for each GHG species for a specified time interval (typically 20 or 100 years). By definition, the GWP for CO_2 is assigned a value of 1, and GWPs for other gases are defined relative to CO_2. In technical terms, GWP is the time-integrated direct (and potentially indirect) radiative forcing of an amount of a GHG species released instantaneously into the atmosphere relative to that of an equal amount of CO_2.

GWP values allow for an "apples-to-apples" comparison of the impacts of emissions of different GHGs. In particular, emissions of mixtures of different GHGs are typically summarized in terms of their CO_2 equivalent (CO_2e) emissions defined as the weighted sum of the emissions of each GHG where the weights are the GWPs. For example, emissions of the three most significant GHGs associated with fossil fuel combustion (CO_2, CH_4, and N_2O) are summarized as

$$CO_2e(MMT/year) = CO_2(MMT/year) + GWP_{CH4} \times CH_4(MMT/year) + GWP_{N2O} \times N_2O(MMT/year)$$

where MMT stands for million metric tons per year.

Because the GWP of a given GHG depends in part on the atmospheric lifetime of the GHG, GWP values depend on the time interval for which they are estimated. The GWP for a relatively short-lived GHG, such as CH_4, is larger over a short time period (for example, 20 years) as compared with a much longer time period (such as 100 years) because most of the CH_4 will have reacted away well before 100 years have passed. Conversely, very long-lived GHGs have a 20-year GWP that is lower than the 100-year GWP because the time integrated radiative forcing is less (relative to CO_2) over the shorter time interval.

As a result of various complex feedbacks in the earth-atmosphere system, GWPs can only be roughly estimated; according to the IPCC, GWPs have a large uncertainty: ±30 percent and ±39 percent for the 20-year and 100-year CH_4 GWPs, respectively, and ±21 percent and ±29 percent for the 20-year and 100-year N_2O GWPs, respectively (IPCC 2013). Estimates of GWPs have been updated over the years as the models used to calculate them have been refined and to reflect the changing composition of the atmosphere that impacts the GWP of each additional ton of GHG emissions. GWPs have been calculated for several GHGs over different time horizons, including 20 years, 100 years, and 500 years. The choice of time horizon depends on the type of application and policy context; hence, no single time horizon is optimal for all policy goals. The United Nations Framework Convention on Climate Change and its Kyoto Protocol[1] adopted the 100-year GWP, and it is used widely as the default measure. For example, the EPA uses the 100-year time horizon in its annual GHG inventories.

This SEIS/RMPA reports CO_2e emissions using GWPs for the 100-year time horizon for consistency with the EPA's inventory as well as GWPs for the 20-year time horizon to more clearly estimate the relative impacts of shorter-lived GHGs (i.e., CH_4) over the 20-year life of the SEIS/RMPA. More information on specific GWPs and time horizons used for this analysis are provided in the section below on *Direct and Indirect Impacts*, *Analysis Methods*.

Physical Manifestations of Climate Change

Warming of the earth's climate since the industrial revolution has been observed to coincide with widespread effects throughout the earth-atmosphere system, including reductions in the extent and duration of polar sea ice and mountain winter snowpack, rising sea levels, increases in mean nighttime minimum temperatures, shifts in historical rainfall patterns, and changes in the frequency, severity, and duration of weather events. These effects, in turn, have affected natural and human systems regardless of cause, implicating the sensitivity of natural and human systems to changing climate (IPCC 2013).

Changes in climate and the potential effects of climate change were described in the 2015 Proposed RMP/Final EIS (pages 3-2 to 3-10). Since that time, the Fourth National Climate Assessment (NCA) was published in November 2018. It was written to help inform decision-makers, utility and natural resource managers, public health officials, emergency planners, and other stakeholders by providing a thorough examination of the effects of climate change in the United States (US Global Change Research Program 2018). The National Oceanic and Atmospheric Administration summarizes some of the key findings of the report by stating that the US is increasingly vulnerable to climate change. It further states that while societal responses

[1] https://unfccc.int

to climate change have expanded, they are not yet at the scale needed to avoid substantial impacts (NOAA 2018). Compared with previous reports, the NCA provides greater detail on regional scales as impacts and adaptation tend to be realized at a more local level.

As reported in the NCA, climate model projections show a warmer future in the Northern Great Plains (Montana, Wyoming, North Dakota, South Dakota, and Nebraska) with conditions becoming consistently warmer in 2 to 3 decades and temperatures rising steadily toward the middle of this century, irrespective of the climate scenario modeled. The NCA relies on recent climate modeling scenarios developed by the integrated assessment modeling community, known as the Representative Concentration Pathways (RCP). The "lower scenario" assumes lower emissions and concentrations of GHGs and aerosols, and projects a lower change in radiative forcing by 2100. The "higher scenario" assumes a continued dependence on fossil fuels and higher GHG emissions and concentrations; it projects a larger change in radiative forcing by 2100.

For the Northern Great Plains, the NCA reports that temperature increases of 2° to 4°F projected by 2050 under the lower scenario are expected to increase the occurrence of both drought and heat waves; these projected trends would be greater under the higher scenario. The probability for more very hot days (those with maximum temperatures above 90°F) is expected to increase. There are projected to be many fewer cool days (those with minimum temperatures less than 28°F), with decreases of 30 days or more per year by mid-century.

The amount, distribution, and variability of annual precipitation are anticipated to change, with increases in winter and spring precipitation of 10 to 30 percent by the end of this century and a decrease in the amount of precipitation falling as snow under a higher scenario. Summer precipitation is expected to vary across the Northern Great Plains, ranging from no change under a lower scenario to 10 to 20 percent reductions under a higher scenario. Further, the frequency of heavy precipitation events is projected to increase, with an increase of about 50 percent in the frequency of 2-day heavy rainfall events by 2050 under the higher scenario. The amount falling in single-day heavy events is projected to increase 8 to 10 percent by mid-century depending on the scenario. While there is high confidence in future increases in temperature, uncertainties exist as to the degree of precipitation variability from year to year and within season (Conant et al. 2018).

The 2017 Montana Climate Assessment (Whitlock et al. 2017) is a report providing information on present-day climate as well as climate terminology, past climate trends, and future climate projections within Montana. Major findings from this report include:

- Annual average temperatures, including daily minimums, maximums, and averages, have risen across the state between 1950 and 2015. The increases range between 2 and 3°F.
- Average winter precipitation decreased by 0.9 inches, which can largely be attributed to natural variability and an increase in El Niño events, especially in the western and central parts of the state. A significant increase in spring precipitation (1.3 to 2.0 inches) also occurred during this period for the eastern part of the state.

- Montana is projected to continue to warm in all geographic locations, seasons, and under all emission scenarios throughout the twenty-first century. By mid-century, Montana temperatures are projected to increase by approximately 4.5 to 6.0°F.

GHG emissions are reported at a number of spatial scales, including globally, nationally, and at the state level. In addition to these scales,[2] GHG emissions from fossil fuels produced on federal lands and emissions reported in the three planning area counties are described below. A comparison of GHG emissions at differing scales provides context against which to compare emissions from a specific action, such as that being evaluated in this SEIS/RMPA.

The US Geological Survey (USGS) recently published a report on GHG emissions from extraction and use of fossil fuels produced on federal lands and GHG sinks (carbon storage by terrestrial ecosystems) on federal lands in the US (USGS 2018). In 2014, nationwide emissions from fossil fuels (oil, gas, and coal) extracted from federal lands were 1,279.0 million metric tons (MMT) carbon dioxide equivalents (CO_2e) of carbon dioxide, 47.6 MMT CO_2e of methane, and 5.5 MMT CO_2e of nitrous oxide based on 100-year GWPs. GHG emissions from production and combustion of fossil fuels produced on federal lands in Montana were 42.1 MMT CO_2e of carbon dioxide (3 percent of total carbon dioxide emissions from all states and offshore areas combined) and 1.2 MMT CO_2e of methane (3 percent of total methane emissions from all states and offshore areas combined) (USGS 2018).

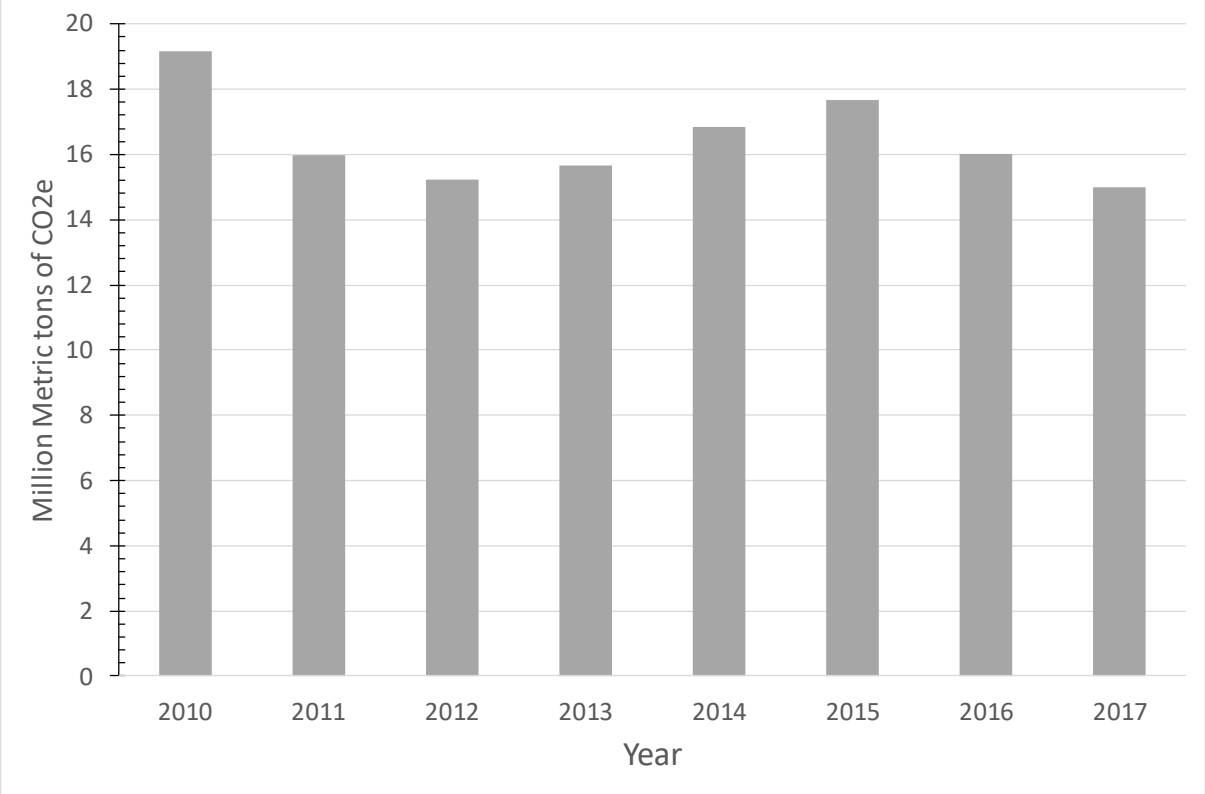
In 2014, carbon storage by terrestrial ecosystems on federal lands in the conterminous United States (not including Alaska and Hawaii) was 83,600 MMT CO_2e. Soils stored 63 percent of carbon, with vegetation and dead organic matter storing 26 percent and 11 percent, respectively. Between 2005 and 2014, the annual rate of net carbon uptake by terrestrial ecosystems in the conterminous US ranged from a sink (sequestration) of 475 MMT tons of CO_2e per year to a source (emission) of 51 MMT CO_2e per year. This was due to changes in climate/weather, land use, land cover change, wildfire frequency, and other factors. Terrestrial ecosystems on federal lands sequestered an average of 195 MMT CO_2e per year nationally between 2005 and 2014. In Montana, the annual average sequestration over the 10-year period was 19 MMT CO_2e per year, while emissions from wildfires averaged 1 to 2 MMT CO_2e per year. The 2014 net emission of GHGs for federal lands in Montana was 20.2 MMT CO_2e per year, indicating that more GHGs were emitted than were sequestered.

The EPA Facility Level Information on Greenhouse Gases Tool (FLIGHT; EPA 2018a) database reports annual GHG emissions from facilities emitting more than 25,000 metric tons of CO_2e per year that are subject to the EPA's Greenhouse Gas Reporting Program (GHGRP) under 40 CFR 98. This includes emissions from most large, stationary sources of GHGs (smaller emitters are not required to report) and emissions from most end uses of fossil fuels. Nationally, the GHGRP accounts for 85 to 90 percent of total GHG emissions accounted for in the EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks.[3] While CH_4 emissions from underground coal mines are included in the GHGRP, emissions from coal strip mines are not. GHG emissions reported under GHGRP by facilities in the 17 counties in the MCFO planning

[2] See *Direct and Indirect Impacts*, *Analysis Methods* for the emission scales used for this analysis.
[3] https://www3.epa.gov/climatechange/ghgemissions/inventoryexplorer/data_explorer_flight.html

area for 2010–2017 are shown in **Diagram 3-1**. Total emissions in the 8-year period from 2010 to 2017 are the lowest in 2017.

Diagram 3-1. GHG Emissions in the 17 Planning Area Counties of the Miles City Field Office



Source: EPA 2018a

3.3.2 Direct and Indirect Impacts

Analysis Methods

This section analyzes the three main GHGs (carbon dioxide, nitrous oxide, and methane) associated with the production, transportation, and downstream combustion of coal, oil, and gas over the life of the SEIS/RMPA. The analysis responds to the GHG- and climate change-related issues identified in the United States District Court, District of Montana, opinion and order (*Western Organization of Resource Councils, et al. v. BLM*) and issues identified through scoping. Details of the methodology used to supplement the GHG and climate change analysis in response to the court's decision for coal, oil, and gas resources are described below. As noted above, coal screening and consideration of climate change impacts to make a reasoned decision on the amount of recoverable coal made available in the SEIS/RMPA (claim #1) are addressed in **Section 2.2**, Alternatives Development.

Coal

Emissions of GHGs are quantified for the estimated future production, transportation, and downstream combustion of federal coal developed within the planning area over the life of the plan. GHG emissions for coal production on federal lands are calculated from the emissions

factors for coal mining equipment reported in the 2015 Proposed RMP/Final EIS (BLM 2015a) and the BLM RFD scenario forecast for 2019 through 2038 (**Appendix C**).[4] In particular, the federal emissions estimates on a unit-production basis (ton/ton of coal production) from the 2015 Proposed RMP/Final EIS Air Resources Technical Support Document for CO_2, CH_4, and N_2O were used along with the current RFD scenario to estimate production equipment GHG emissions for each year during the 2019–2038 planning period. The RFD forecast prepared by the BLM included federal and nonfederal annual coal production for each of the five mines in the planning area. Methane emissions from coal off gassing were calculated using the default emissions factor for surface mines in EPA's *State Inventory and Projection Tool*[5] for Montana and the RFD coal production forecasts.

The BLM estimated transportation emissions for the transport of produced coal via rail using diesel locomotives in areas that do not have "mine-to-mouth" operations. The BLM assumed an average one-way train haul distance of 1,500 miles and calculated emissions using the RFD-predicted annual tons of coal. The BLM conservatively based average train haul distance in miles on the farthest distance that coal would be transported by rail from any of the three mines (Absaloka, Decker, and Spring Creek); this was determined by the BLM MCFO from an internet search of Burlington Northern Santa Fe Railway miles. The BLM based emissions calculations on emission factors developed using data from the Burlington Northern Santa Fe Railway and EPA as discussed below.

Burlington Northern Santa Fe developed a fuel efficiency factor for diesel locomotives of 849 ton-miles per gallon in its 2017 Corporate Responsibility and Sustainability Report (Burlington Northern Santa Fe 2017). The EPA provided emission factors for diesel locomotives of 20.9 pounds per gallon for CO_2, 0.0018 pounds per gallon for CH_4, and 0.0006 pounds per gallon for N_2O as presented in the Greenhouse Gas Inventory Guidance, Direct Emissions from Mobile Combustion Sources, January 2016 (EPA 2016). To account for the reduced load on the return trip when the coal cars are typically empty, the BLM estimated fuel consumption at 21.8 percent of the outbound (loaded) fuel consumption based on the ratio of the total weight of the unloaded train to that of the loaded train (American Association of Railroads 2018; Burlington Northern Santa Fe 2019).

Downstream emissions from federal and nonfederal coal combustion are determined using GHG emissions factors for stationary combustion of sub-bituminous coal from the EPA Emission Factors for Greenhouse Gas Inventories, March 2018 (EPA 2018b). The emission factor for sub-bituminous coal was used because more than 99 percent of coal produced within the planning area is sub-bituminous. The emission factors used for CO_2, CH_4, and N_2O are 1,676 kilograms per short ton, 190 kilograms per short ton, and 28 kilograms per short ton, respectively.

[4] In the 2015 Proposed RMP/Final EIS, CH_4 emissions from coal production were estimated as 0.0006 percent of engine CO_2 emissions; N_2O emissions were estimated as 0.001 percent of engine CO_2 emissions (*Air Resource Technical Support Document [ARTSD] for Emission Inventories, Near-Field Modeling, and Visibility Screening*, p. A-79).
[5] https://www.epa.gov/statelocalenergy/state-inventory-and-projection-tool

The GHG emissions for production, transportation, and combustion are the same under the No Action Alternative (Alternative A) and the action alternatives (Alternatives B and C). This is because the same RFD scenario was forecasted in all three alternatives. GHG emissions are adjusted to use GWP values based on both 20- and 100-year time horizons to calculate carbon dioxide equivalents (see **Table 3-1** for a description of the GWPs and scientific relevance of these two time horizons). The BLM selected 100-year GWPs because the 100-year time horizon has been used in emission inventories compiled by the EPA (EPA 2019a), and to evaluate the relative long-term effect of emissions. The BLM selected 20-year GWPs to better evaluate near-term impacts of methane emissions over the life of the RMPA CO_2 (see discussion under *Affected Environment* above). The EPA's national inventories do not include carbon-climate feedbacks or CO_2 from methane oxidation.

GWPs for other time horizons are not commonly used in the climate change community. Other emissions weighting metrics, such as the global temperature change potential (IPCC 2013), are not commonly used for reporting GHG emissions. Evaluations of the relative importance of emissions of short-lived GHG species relative to CO_2 are sensitive to the particular metric used, which should be carefully selected to match the specific policy question being addressed. The CH_4 and N_2O GWP values shown in **Table 3-1** do not include climate-carbon feedbacks and the effect of CO_2 from methane oxidation. When considering climate-carbon feedbacks and methane oxidation, the 100-year GWPs for CH_4 and N_2O are 36 and 298, respectively, and the 20-year GWPs are 87 and 268, respectively. However, as mentioned above, there is large uncertainty in the GWP estimates: ±30 percent and ±39 percent for the 20-year and 100-year CH_4 GWPs, respectively, and ±21 percent and ±29 percent for the 20-year and 100-year N_2O GWPs, respectively (IPCC 2013). In particular, uncertainties related to the climate-carbon feedbacks are large (IPCC 2013).

Table 3-1
GWPs for 100-Year and 20-Year Time Horizons and Rationale

Time Horizon	GWP[1]			Rationale for Time Horizon
	CO_2	CH_4	N_2O	
100-Year[1]	1	28	265	The 100-year time horizon for GWP has been adopted by the United Nations Framework Convention on Climate Change and its Kyoto Protocol and used widely as the default metric (IPCC 2014); consistent with the IPCC Fifth Assessment Report in its science communications (IPCC 2013, 2014).
20-Year[1]	1	84	264	Prioritizes gases with shorter lifetimes, such as CH_4, because it does not consider impacts that happen more than 20 years after the emissions occur. Because all GWPs are calculated relative to CO_2, GWPs based on a shorter time frame will be larger for gases with lifetimes shorter than that of CO_2, and smaller for gases with lifetimes longer than CO_2 (IPCC 2014).

Source: [1]IPCC 2014

The higher GWP values accounting for both climate-carbon feedbacks and methane oxidation would fall within the uncertainty bounds mentioned above. In addition, IPCC used the 100-year GWPs in **Table 3-1** in the calculation of the worldwide GHG inventory total of 52 gigatonnes

CO_2e per year in the Fifth Assessment (IPCC 2014). For the aforementioned reasons, the SEIS analysis uses the GWP values listed in **Table 3-1**.

The state, national, and global emission totals of GHGs (see **Table 3-2**) are compared with the potential direct and indirect impacts of coal mining on federal lands in the MCFO. A comparison with other metrics is provided for additional context.

Table 3-2
GHG Emissions (CO_2e) at Various Scales

Scale	Emissions	Source
Montana	20.1 million metric tons/year (2017)	EPA 2018a
National	6,457 million metric tons/year (2017)	EPA 2019a
Global	52 gigatonnes/year (2010)	IPCC 2014

Oil and Gas

GHG emissions are quantified for production and downstream combustion of oil, conventional natural gas, and coalbed natural gas (CBNG). The annual production estimates for 2019 to 2038 are the same as the fluid minerals production forecast under Alternative E in the 2015 Proposed RMP/Final EIS (BLM 2015a). GWP values that reflect 20- and 100-year time horizons (see **Table 3-1**) are used to obtain CO_2e emissions.

Annual oil and gas production forecast estimates are also used to form the basis of the emissions estimates for downstream combustion of oil and gas. Oil and gas combustion emissions are quantified using the EPA GHG emission factors for stationary source combustion of No. 2 fuel oil and natural gas, respectively. GHG emissions due to transportation of oil and gas from the planning area are qualitatively discussed.

The GHG emissions quantified for production and combustion are the same under the No Action Alternative (Alternative A) and the action alternatives (Alternatives B and C). This is because the same RFD scenario is forecasted in all three alternatives. GHG emissions are reported using both 100-year and 20-year GWPs for reasons noted in the above discussion of coal. State, national, and global emission totals of GHGs from the EPA FLIGHT data (EPA 2018a), the EIA 2019 Annual Energy Outlook (EIA 2019), and the IPCC Fifth Assessment Report (IPCC 2014) are reported for comparison with the potential direct and indirect impacts of oil and gas development and production from federal minerals within the MCFO planning area (see **Table 3-2**). A comparison with other metrics is provided for additional context.

Assumptions

- The BLM prepared the RFD forecast for 2019 through 2038 (**Appendix C**), which includes federal and nonfederal annual coal production forecasts within the planning area. It was used to estimate annual emissions from coal production, transportation, and downstream combustion.
- On average over the 2019–2038 RFD forecast period, 83 percent of coal from mines in the planning area would be transported by diesel rail locomotives over an average distance of 1,500 miles one way. The BLM conservatively based the distance on the farthest distance that coal would be transported by rail from any of the

planning area mines; this was determined by the BLM MCFO from an internet search of Burlington Northern Santa Fe Railway miles. Fuel consumption to return empty coal railcars is 21.8 percent of the outbound loaded fuel consumption.

- All future coal produced is combusted in US energy generating units.
- Oil and gas production rates were based on year 20 producing-well counts and average per well production that were used to estimate production GHG emissions in the 2015 Proposed RMP/Final EIS, Alternative E (BLM 2015a).

Indicators

- MMT of CO_2, CH_4, and N_2O and the resulting CO_2e from coal production, transportation, and downstream combustion over the life of the RMPA
- MMT of CO_2, CH_4, and N_2O and resulting CO_2e from oil and gas production, and downstream combustion over the life of the RMPA
- GHG emissions from coal, oil, and gas as a percentage of state, national, and global emissions and other metrics
- GHG emission equivalencies from power plants, cars, home electricity use, and equivalent GHG emissions avoided by wind turbines or sequestered by forests.

Impacts Common to all Alternatives

Coal

Table 3-3 summarizes GHG emissions from federal coal production, transportation, and downstream combustion for each forecast year. The details by pollutant (CO_2, CH_4, and N_2O) are shown in **Appendix B**.

The GHG emissions discussed above would contribute incrementally to global climate change. The lack of precise scientific tools (models with sufficient spatial and temporal resolution) to forecast climate change at local scales limits the ability to quantify accurately the potential future impacts of climate change in the planning area. Furthermore, potential impacts on climate change are influenced by GHG emission sources from around the world; given the global and complex nature of climate change, it is not possible to attribute a particular climate impact in any given region to GHG emissions from a particular source. Instead, the GHG emissions due to the federal action are compared with state, national, and global GHG emissions along with other metrics.

Total GHG emissions from federal coal production, transportation, and downstream combustion shown in **Table 3-3**, over the RMPA lifetime, based on 20-year and 100-year GWPs are 802 MMT CO_2e and 775 MMT, respectively. The downstream combustion portion is 763 MMT and 758 MMT, respectively.

Table 3-3
GHG Emissions as CO_2e from Federal Coal Production, Transportation, and Combustion based on 20-year and 100-year GWPs

Year	Federal RFD Coal Production (MMst)	CO_2e (MMT, 20-year GWP)				CO_2e (MMT, 100-year GWP)			
		Production (MMT)	Transportation (MMT)	Combustion (MMT)	Total (MMT)	Production (MMT)	Transportation (MMT)	Combustion (MMT)	Total (MMT)
2019	18.48	1.40	0.18	31.40	32.98	0.49	0.18	31.21	31.88
2020	25.44	1.92	0.28	43.23	45.43	0.67	0.28	42.96	43.91
2021	25.26	1.91	0.28	42.93	45.12	0.67	0.28	42.67	43.61
2022	24.60	1.86	0.28	41.80	43.94	0.65	0.28	41.54	42.47
2023	23.93	1.81	0.28	40.67	42.76	0.63	0.28	40.41	41.32
2024	23.93	1.81	0.28	40.67	42.76	0.63	0.28	40.41	41.32
2025	23.93	1.81	0.28	40.67	42.76	0.63	0.28	40.41	41.32
2026	23.93	1.81	0.28	40.67	42.76	0.63	0.28	40.41	41.32
2027	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2028	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2029	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2030	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2031	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2032	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2033	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2034	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2035	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2036	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2037	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
2038	21.61	1.63	0.25	36.72	38.61	0.57	0.25	36.50	37.31
Total	**345.76**	**33.93**	**5.12**	**762.73**	**801.78**	**11.82**	**5.10**	**757.96**	**774.88**
Average	**22.07**	**1.70**	**0.26**	**38.14**	**40.09**	**0.59**	**0.25**	**37.90**	**38.74**

RFD: Reasonably Foreseeable Development
MMst: million short tons
MMT: million metric tons

Average annual GHG emissions from federal coal production within the planning area, shown in **Table 3-3**, are 1.7 MMT CO_2e and 0.59 MMT CO_2e for 20-year and 100-year GWPs, respectively. These represent 8.5 percent and 2.9 percent, respectively, of the 20.1 MMT CO_2e total Montana GHG emissions for major facilities in 2017 as reported in the EPA FLIGHT data (EPA 2018a).

Average annual GHG emissions from federal coal production, transportation, and downstream combustion, shown in **Table 3-3**, are 40.1 MMT CO_2e and 38.7 MMT CO_2e for 20-year and 100-year GWPs, respectively. When compared with US GHG emissions, these represent 0.62 percent and 0.60 percent, respectively, of the 6,457 MMT CO_2e total 2017 US GHG emissions reported by the EPA (EPA 2019a). When compared with worldwide GHG emissions, these

represent 0.08 percent and 0.07 percent, respectively, of the 52 gigatons total 2010 global GHG emissions in CO_2e estimated by the IPCC (IPCC 2014).

The average annual GHG emissions due to production, transportation, and downstream combustion of coal forecast to be produced in the MCFO (using the 100-year GWP) are equivalent to the following, based on the EPA Greenhouse Gas Equivalencies Calculator (EPA 2019b). These equivalencies are presented to put the GHG emissions from the RMPA in context of other sources readily understandable to the public.

- GHG emissions from 10 coal-fired power plants in 1 year
- GHG emissions from 8,222,053 passenger vehicles driven for 1 year
- GHG emissions from 6,755,729 homes' electricity use for 1 year
- GHG emissions that may be avoided by 8,209 wind turbines running for 1 year
- Carbon sequestered by 45,593,957 acres of US forests in 1 year

The corresponding numbers based on the 20-year GWP are 10 coal-fired power plants, 8,511,677 vehicles, 6,991,151 homes, 8,495 wind turbines, and 47,182,802 acres of forest.

Oil and Gas

Tables 3-4, **3-5**, and **3-6** summarize GHG emissions from the production and downstream combustion of federal oil, conventional natural gas, and coalbed natural gas, respectively. The details by pollutant (CO_2, CH_4, and N_2O) are shown in **Appendix B**. Oil and gas production estimates are identical in each year because they are based on the year 20 producing-well counts and average per well production in the 2015 Proposed RMP/Final EIS; the production is estimated from the product of these two quantities. This is likely a conservatively high estimate of annual production because the number of producing wells will be somewhat lower during the first few years.

GHG emissions of CO_2, CH_4, and N_2O also would result from transportation of oil and gas from the planning area by pipeline, rail, or tanker truck. However, the BLM does not have readily available data on how the transport of liquid and gaseous fossil fuels are distributed among the forms of transportation (pipeline, rail, and tanker truck), or the quantity distributed to each type, in order to quantify emissions that would be representative of actual or reasonably foreseeable future operations. These GHG emissions attributable to the transport of oil and gas produced from the planning area would occur in the form of CO_2, CH_4, and N_2O.

The BLM has estimated GHG emissions attributable to the end use of the produced liquid and gaseous fossil fuels by assuming that 100 percent is combusted for heat or energy production. Although the actual end use of these products also may include transportation fuels; feedstocks for plastics, chemical, and synthetic materials production; or other manufacturing, it is reasonably foreseeable to estimate emissions from combustion.

Table 3-4
GHG Emissions as CO_2e from Federal Oil Production and Combustion based on 20-year and 100-year GWPs

Year[a]	Federal RFD Oil Production Rate (MMBO[b])	CO_2e (20-year GWP)			CO_2e (100-year GWP)		
		Production (metric tons)	Combustion (metric tons)	Total (metric tons)	Production (metric tons)	Combustion (metric tons)	Total (metric tons)
2019	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2020	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2021	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2022	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2023	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2024	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2025	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2026	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2027	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2028	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2029	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2030	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2031	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2032	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2033	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2034	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2035	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2036	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2037	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
2038	3.0	77,624	1,312,474	1,390,099	62,600	1,309,549	1,372,149
Total	**60.0**	**1,552,488**	26,249,489	27,801,977	**1,252,003**	26,190,983	27,442,986
Average	**3.0**	**77,624**	1,312,474	1,390,099	**62,600**	1,309,549	1,372,149

[a]Values are identical for each year because only a single RFD scenario is available for the MCFO SEIS/RMPA (see text).
[b]Million barrels of oil

As in the case of coal production, the GHG emissions discussed above due to oil and gas production and combustion would contribute incrementally to global climate change, although at a much lower level relative to the coal production, transportation, and combustion. As noted previously, the lack of precise scientific tools (models with sufficient spatial and temporal resolution) to forecast climate change at local scales limits the ability to accurately quantify the future impacts on climate change in the planning area. Furthermore, potential impacts on climate change are influenced by GHG emission sources from around the world; it is not possible to accurately distinguish the impacts on global climate change from GHG emissions originating from just the planning area. Instead, the GHG emissions due to the federal action are compared with state, national, and global GHG emissions, along with other metrics.

Total GHG emissions from federal oil production and downstream combustion (see **Table 3-4**) over the RMPA lifetime are based on 20-year and 100-year GWPs. They are 27.8 MMT CO_2e and 27.4 MMT, respectively. Downstream combustion contributes 26.2 MMT and 26.2 MMT, respectively.

The average annual production emissions in the planning area are based on 20-year and 100-year GWPs. They represent 0.4 percent and 0.3 percent, respectively, of the 20.1 MMT total Montana GHG emissions in CO_2e for major facilities in 2017, as reported in the EPA FLIGHT data (EPA 2018a).

Average annual GHG emissions from the production and downstream combustion of federal oil produced in the MCFO (see **Table 3-4**) are 1,390,099 metric tons CO_2e and 1,372,149 metric tons CO_2e using 20-year and 100-year GWPs, respectively. When compared with US GHG emissions, these represent 0.02 percent and 0.02 percent, respectively, of the 6,457 MMT CO2e total 2017 US GHG emissions reported by the EPA (2019a). When compared with worldwide GHG emissions, these represent 0.0027 percent and 0.0026 percent, respectively, of the 52-gigatonne 2010 global GHG emissions in CO_2e estimated by the IPCC (IPCC 2014).

The average annual GHG emissions reported above using the 100-year GWP are equivalent to the following based on the EPA Greenhouse Gas Equivalencies Calculator (EPA 2019b). As mentioned above, these equivalencies are presented to put the GHG emissions from the RMPA in context of other sources readily understandable to the public.

- GHG emissions from 0.35 coal-fired power plants in 1 year (i.e., one power plant running for 128 days)
- GHG emissions from 291,327 passenger vehicles driven for 1 year
- GHG emissions from 239,284 homes' electricity use for 1 year
- GHG emissions that may be avoided by 291 wind turbines running for 1 year
- Carbon sequestered by 1,614,912 acres of US forest in 1 year

The corresponding numbers, based on the 20-year GWP, are 0.36 coal-fired power plant GHG emissions (i.e., one power plant running for 130 days), 295,138 vehicles, 242,414 homes, 278 wind turbines, and 1,636,038 acres of forest.

Total GHG emissions from federal natural gas production and downstream combustion (total of conventional natural gas and CBNG production and combustion) are shown in **Tables 3-5** and **3-6** over the RMPA lifetime. They are based on 20-year and 100-year GWPs and are 15.3 MMT CO_2e and 15.1 MMT CO_2e, respectively. Downstream combustion represents 14.3 MMT CO_2e and 14.3 MMT CO_2e, respectively.

The average annual production emissions in the planning area based on 20-year and 100-year GWPs represent 0.2 percent and 0.2 percent, respectively, of the 20.1 MMT CO_2e total Montana GHG emissions for major facilities in 2017, as reported in the EPA FLIGHT data (EPA 2018a).

Table 3-5
GHG Emissions as CO_2e from Federal Conventional Natural Gas Production and Combustion, Based on 20-year and 100-year GWPs

Year[a]	Federal RFD Natural Gas Production (BCF[b])	CO_2e (20-year GWP)			CO_2e (100-year GWP)		
		Production (metric tons)	Combustion (metric tons)	Total (metric tons)	Production (metric tons)	Combustion (metric tons)	Total (metric tons)
2019	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2020	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2021	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2022	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2023	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2024	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2025	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2026	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2027	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2028	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2029	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2030	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2031	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2032	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2033	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2034	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2035	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2036	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2037	5.1	23,832	278,765	302,598	19,528	278,471	297,999
2038	5.1	23,832	278,765	302,598	19,528	278,471	297,999
Total	**102.0**	**476,648**	**5,575,308**	**6,051,956**	**390,550**	**5,569,424**	**5,959,974**
Average	**5.1**	**23,832**	**278,765**	**302,598**	**19,528**	**278,471**	**297,999**

[a]Values are identical for each year because only a single RFD scenario is available for the MCFO SEIS/RMPA (see text).
[b]Billion cubic feet

Table 3-6
GHG Emissions as CO_2e from Federal Coalbed Natural Gas Production and Combustion, Based on 20-year and 100-year GWPs

Year[a]	Federal RFD Natural Gas Production (BCF[b])	CO_2e (20-year GWP)			CO_2e (100-year GWP)		
		Production (metric tons)	Combustion (metric tons)	Total (metric tons)	Production (metric tons)	Combustion (metric tons)	Total (metric tons)
2019	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2020	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2021	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2022	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2023	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2024	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2025	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2026	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2027	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2028	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2029	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2030	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2031	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2032	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2033	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2034	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2035	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2036	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2037	8.0	25,289	435,471	460,761	19,765	435,012	454,777
2038	8.0	25,289	435,471	460,761	19,765	435,012	454,777
Total	**160.0**	**505,789**	**8,709,428**	**9,215,217**	**395,295**	**8,700,236**	**9,095,530**
Average	**8.0**	**25,289**	**435,471**	**460,761**	**19,765**	**435,012**	**454,777**

[a]Values are identical for each year because only a single RFD scenario is available for the MCFO SEIS/RMPA (see text).
[b]Billion cubic feet

The average annual GHG emissions from federal natural gas production and downstream combustion (total of conventional natural gas and CBNG production and combustion) are shown in **Tables 3-5** and **3-6**. They are 0.76 MMT CO_2e and 0.75 MMT CO_2e using 20-year and 100-year GWPs, respectively. These values represent 0.012 percent and 0.012 percent, respectively, of the 6,457 MMT CO_2e total 2017 US GHG emissions reported by the EPA (2019a).

The average annual GHG emissions combined from production and downstream combustion of federal oil and gas developed in the MCFO (**Tables 3-4** to **3-6**) are 2.2 MMT CO_2e and 2.1 MMT CO_2e using 20-year and 100-year GWPs, respectively. When compared with US GHG emissions, these values represent 0.034 percent and 0.033 percent, respectively, of the 6,457 MMT CO_2e total 2017 US GHG emissions reported by the EPA (EPA). When compared with worldwide GHG emissions, these represent 0.0042 percent and 0.0040 percent, respectively, of the 52-gigatonne 2010 global GHG emissions in CO_2e estimated by the IPCC (IPCC 2014).

The average annual GHG emissions estimated above using the 100-year GWP are equivalent to the following based on the EPA Greenhouse Gas Equivalencies Calculator (2019b):

- GHG emissions from 0.539 coal-fired power plants in 1 year (i.e., one power plant running for 197 days)
- GHG emissions from 445,860 passenger vehicles driven for 1 year
- GHG emissions from 366,211 homes' electricity use for 1 year
- GHG emissions that may be avoided by 445 wind turbines running for 1 year
- Carbon sequestered by 2,471,536 acres of US forest in 1 year

The corresponding numbers based on the 20-year GWP are 0.565 coal-fired power plants (i.e., one power plant running for 206 days), 467,000 vehicles, 384,000 homes, 466 wind turbines, and 2.6 million acres of forest.

3.3.3 Cumulative Impacts

Cumulative impacts are evaluated from the total production of federal and nonfederal coal, oil, and gas within the planning area as well as other past, present, and reasonably foreseeable sources of reportable GHG emissions. GHG emissions from the production, transportation, and downstream combustion of coal forecast to be produced on nonfederal lands in the planning area are evaluated following methods similar to those described above using EIA 2019 nonfederal coal production forecasts for the plan period. GHG emissions from the production and downstream combustion of oil and gas forecast to be developed from nonfederal minerals in the planning area, as described in the 2015 Proposed RMP/Final EIS (BLM 2015a), were assessed using methods similar to those described for federal oil and gas above. GWP values for both 20- and 100-year time horizons were used (see **Table 3-1**).

Direct and indirect emissions from nonfederal coal, oil, and gas were combined with direct and indirect emissions from federal coal, oil, and gas, as described above. These emission totals were also combined with emissions from large sources other than coal mining and oil and gas development and production in the planning area for the most recent year (2017) EPA FLIGHT data, as well as GHG emissions from the production and downstream combustion of coal, oil, and gas from the BLM Buffalo, Wyoming, Field Office per the 2019 Resource Management Plan Amendment (BLM 2019).

Table 3-7 shows the cumulative effects in terms of GHG emissions from the sources listed above. These include GHG emissions in the planning area. Examples are federal and nonfederal coal and oil and gas and other major sources, as well as downstream combustion emissions outside the area resulting from coal and oil and gas developed in the area.

Table 3-7
GHG Emissions as CO_2e from Cumulative Sources Based on 20-year and 100-year GWPs

Production	Emissions	GHG Emissions in CO_2e (MMT/year)	
		20-year GWP	100-year GWP
Federal coal production (average over planning period 22.4 MMst/year	GHG emissions from federal coal production (average)	1.7	0.6
	GHG emissions from federal coal transportation (average)	0.3	0.3
	GHG emissions from federal coal combustion (average)	38.1	37.9
Nonfederal coal production (average) 16.3 MMst/year	GHG emissions from nonfederal coal production (average)	1.3	0.5
	GHG emissions from nonfederal coal transportation (average)	0.2	0.2
	GHG emissions from nonfederal coal combustion (average)	27.6	27.4
Federal oil production (average) 3.0 MMBO/year	GHG emissions from federal oil production (average)	0.1	0.1
	GHG emissions from federal oil combustion (average)	1.3	1.3
Federal production of conventional and coalbed natural gas (average) 13.1 BCF/year	GHG emissions from federal gas production (average)	0.1	0.1
	GHG emissions from federal gas combustion (average)	0.7	0.7
Nonfederal oil production (average) 20.6 MMBO/year	GHG emissions from nonfederal oil production (average)	0.5	0.4
	GHG emissions from nonfederal oil combustion (average)	8.9	8.9
Nonfederal production of conventional and coalbed natural gas (average) 45 BCF/year	GHG emissions from nonfederal gas production (average, MMT/year)	0.5	0.4
	GHG emissions from nonfederal gas combustion (average)	2.5	2.5
Other cumulative GHG emission sources	GHG emissions from other major sources in 2017 in planning area from FLIGHT (EPA 2018a)*	0.8	0.8
Other cumulative GHG emission sources	BLM Buffalo, Wyoming, Field Office production and downstream combustion GHG emissions for coal, oil, and gas**	461.8	444.3
Cumulative GHG emissions in CO_2e (annual average over plan period)	-	**546.4**	**526.3**

All numbers shown are annual average over the planning period except for FLIGHT data
FLIGHT = Facility Level Information on Greenhouse Gases Tool; GHG = greenhouse gases; MMst = million short tons; MMT = million metric tons; MMBO = million barrels of oil; BCF = billion cubic feet
Cumulative totals may not add up due to rounding.
* The FLIGHT data shown exclude Colstrip and Lewis & Clark power plants, which are already accounted for in the downstream combustion category.
** Data Source: BLM Buffalo Field Office 2019 RMPA

3.3.4 Summary

GHG emissions from the production and downstream combustion of coal, oil, and conventional and coalbed natural gas open to development under the SEIS/RMPA were calculated using 100-year and 20-year GWPs to represent GHG impacts over the longer-term 100-year time span used in the EPA's national GHG inventory and the shorter 20-year life of the RMPA for comparison, respectively. GHG emissions from coal transportation were also quantified. GWP values selected for this analysis represent the most current widely recognized and widely used estimates in the climate science community. Differences in CO_2e emissions between the two time horizons mostly reflect the short atmospheric lifetime of methane relative to carbon dioxide and nitrous oxide. As a result, the differences are largest for sources such as coal production with relatively large ratios of methane to carbon dioxide emissions.

Coal, oil, and gas production, and therefore GHG emissions, are the same under the No Action Alternative (Alternative A) and the action alternatives (Alternatives B and C). Average annual GHG emissions over the SEIS/RMPA plan period for coal, oil, and gas are compared for federal and nonfederal resources and with other cumulative sources in **Table 3-8**. Cumulative annual average emissions (total CO_2e) are 546.4 MMT/year and 526.3 MMT/year using the 20-year and 100-year time horizon GWPs, respectively. These values represent 8.2 percent and 1.0 percent of total 2017 national and 2010 global annual CO_2e emissions, respectively, based on the 100-year time horizon values. They will contribute to the climate change impacts described above under *Affected Environment*.

Over the life of the plan, cumulative RMPA sources will release 10,928 and 10,524 MMT CO_2e for 20-year and 100-year time horizon GWPs, respectively. When considering production and combustion emissions associated with the MCFO only, approximately half of emissions from the RFD scenario are associated with nonfederal resources (see **Table 3-8**). Other cumulative sources in the Miles City planning area contribute just over 1 percent of total emissions (see **Table 3-8**). Other cumulative sources due to BLM Buffalo Field Office production and downstream combustion of coal and oil and gas contribute approximately 85 percent of total emissions (see **Table 3-8).** Downstream combustion is the dominant source of GHGs for coal and oil and gas when comparing MCFO production and downstream combustion emissions; combustion CO_2e emissions account for over 90 percent of the total MCFO (action) emissions (see **Table 3-7**).

By 2038, global GHG emissions are estimated to be between approximately 30 to 80 gigatons of CO_2e annually under the IPCC lower-bound and higher-bound Representative Concentration Pathways (RCP 2.6 and RCP 8.5), respectively (IPCC 2014). Cumulative annual average emissions over the plan period when considering emissions in the MCFO planning area and BLM Buffalo Field Office production and combustion emissions will then represent between 1.8 percent and 0.7 percent of the global emissions under different future global representative concentration scenarios and will contribute, in part, to the climate change impacts described above under *Affected Environment*.

Table 3-8
Summary of Annual Average GHG Emissions from Coal, Oil, and Gas Production, Transport, and Downstream Combustion over the 20-year Life of the MCFO SEIS/RMPA RFD Scenario

Source	CO_2e MMT/year (20-year GWPs)	CO_2e MMT/year (100-year GWPs)
Federal action total	42.3	40.9
Nonfederal total	41.5	40.3
Other cumulative sources in the SEIS/RMPA planning area	0.8	0.8
Other cumulative GHG emissions due to BLM Buffalo Field Office production and downstream combustion of coal and oil and gas	461.8	444.3
Grand total (annual average over plan period)	546.4	526.3

* Totals may not add up due to rounding.

3.4 WATER RESOURCES

3.4.1 Affected Environment

This section incorporates by reference the affected environment described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Water Resources – Affected Environment,* pages 3-25 through 3-37). A summary as it pertains to the decisions for this SEIS/RMPA is included below.

The coal development potential areas are located in the Tongue River and Powder River watersheds, in the southwest section of the MCFO boundary, and the Yellowstone River watershed, which is located upstream from the confluence of the Yellowstone River and the Missouri River. These areas include smaller perennial streams, intermittent streams, and ephemerals streams; in the planning area, more than 97 percent of stream miles are intermittent and ephemeral.

Geology for the coal development potential areas consists primarily of Tertiary bedrock, Quaternary alluvium, and Quaternary glacial till. These parent materials tend to form highly erosive, fine-grained soils. Streambeds typically consist of sand and silt, with few bedrock channels. Stream morphology and stability are dependent on the presence and type of riparian vegetation due to the lack of control structures (rocks, cobbles, and bedrock).

3.4.2 Direct and Indirect Impacts

Analysis Methods

This analysis focuses on the impacts of coal leasing and development on municipal watersheds. Perennial streams and riparian and wetland areas were made unacceptable for further consideration for coal leasing through the multiple-use screen in the action alternatives; therefore, there would be no impacts on those areas under the action alternatives.

Similarly, 100-year floodplains (unsuitability criterion 16) and alluvial valley floors (unsuitability criterion 19) are unsuitable for coal mining without exception. These areas total 4,230 acres and 53,990 acres, respectively, in the three-county area of forecasted disturbance. Because these areas are unsuitable without exception, they would be protected from coal development in the action alternatives and are not carried forward for additional analysis.

Impacts under Alternative A are as described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Water Resources – Environmental Consequences [Alternative E]*, page 4-69). Municipal watersheds are present in all alternatives and are discussed further below. Finally, national resource waters (unsuitability criterion 18) are not present in the decision area, so these are also not carried forward for detailed analysis.

Assumptions

- Surface disturbance, especially in areas with highly erosive soils, can affect surface water quality by increasing sediment transported to small drainages and ultimately to larger streams during runoff events.
- The BLM will help state agencies ensure that state rules and regulations are met or exceeded by reviewing permitting information submitted as part of the BLM actions; but, it does not have the authority to enforce state regulations or assume liability in cases where state water standards are not met by parties involved in BLM actions.

Indicator

- Acres acceptable for further consideration for coal leasing and future development in municipal watersheds as identified in the unsuitability criterion 17 (**Appendix A**)

Alternative A

Alternative A would maintain the coal screen results used for the 2015 Proposed RMP/Final EIS analysis (BLM 2015a; *Minerals Appendix*, pages MIN-1 through MIN-137). No municipal watersheds were identified in the coal screen results. It is now known that there are approximately 9,540 acres of designated municipal watersheds in the three-county area where development is predicted to occur. Up to approximately 5,640 acres of these watersheds are forecasted to be disturbed.

Erosion and sedimentation would likely increase in disturbed areas due to vegetation removal; however, surface water quality would be protected by the implementation of best management practices required by the Montana Department of Environmental Quality. Any water produced by mining operations cannot be discharged to surface waters without a Montana Pollutant Discharge System permit, which provides some protection for water quality in the municipal watershed. Water quantity is also regulated by the Montana Department of Natural Resources and Conservation.

Alternative B

Under unsuitability criterion 17, the BLM identified 5,300 acres of municipal watersheds in the impact analysis area for Alternative B as unsuitable with exception. The RFD scenario forecasts that up to 5,640 acres of surface disturbance would be expected in the impact analysis area, which could include all 5,300 acres of municipal watersheds identified in the impact analysis area.

These watersheds would be considered unsuitable for coal development. There is an exception that allows the BLM to consult with the municipality and determine that coal mining within the municipal watershed will not adversely affect the watershed to any significant degree. This would assure any effects of coal development on municipal watersheds would meet state water requirements for quality or quantity within the watershed.

Alternative C

Alternative C applies the same water resources multiple-use and unsuitability criteria as Alternative B. There are 4,360 acres of municipal watersheds unsuitable with exception within the Alternative C impacts analysis area.

Effects of coal development on municipal watersheds are the same as those described for Alternative B; however, because there are less acres of municipal watersheds unsuitable with exception under Alternative C within the RFD scenario (1,280 and 60 acres less than Alternatives A and B, respectively), there could be less effect on municipal watersheds under Alternative C compared with Alternatives A and B. This would depend on the ultimate location of operations and development at the project level.

3.4.3 Cumulative Impacts

Cumulative impacts for Alternative A are described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Water Resources – Cumulative Impacts [Alternative E]*, page 4-69). For all water resources except municipal watersheds, cumulative impacts for Alternatives B and C would be the same as those under Alternative A. For municipal watersheds, there would be a slight reduction in cumulative impacts for Alternatives B and C, since municipal watersheds in the impact analysis area are less than the forecasted 5,640 acres of surface disturbance possible under the RFD scenario. Under Alternatives B and C, multiple-use screening would remove 10,690 acres of perennial, riparian, and wetland resources (**Appendix A**), which would further reduce cumulative impacts on water resources in the planning area compared with Alternative A.

3.5 WILDLIFE, INCLUDING AQUATIC AND SPECIAL STATUS SPECIES

3.5.1 Affected Environment

This section incorporates by reference the affected environment described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Fish, Aquatic, and Wildlife Habitat, Including Special Status Species*, pages 3-45 through 3-67). A summary as it pertains to the decisions for this SEIS/RMPA is included below.

The BLM, in cooperation with state and other federal wildlife agencies, is responsible for managing habitat; state and federal wildlife management agencies (Montana Fish, Wildlife and Parks (MFWP) and the US Fish and Wildlife Service [USFWS]) have primary authority for overseeing management of wildlife populations.

General Wildlife

Pronghorn antelope *(Antilocapra Americana)* are the second-most abundant big game species in the planning area. Although generally associated with grasslands and shrublands, they also will use agricultural fields. Crucial pronghorn winter habitat is largely contained within areas

identified as greater sage-grouse priority habitats and at a lower level within crucial mule deer winter range.

Mule deer (*Odocoileus hemionus*) are the most abundant big game species in the planning area and use the greatest diversity of habitats. While mule deer use all habitat types, they generally prefer sagebrush, grassland, hardwood draws, badland breaks, and conifer habitats.

White-tailed deer (*Odocoileus virginianus*) are common in the planning area and prefer riparian habitats and conifer areas, but they also will use a variety of other habitats. Suitable crucial winter habitat is a key factor for white-tailed deer survival, and winter concentration areas occur almost exclusively in riparian and wetland habitats and dense pine. Upland game birds include sharp-tailed grouse (*Tympanuchus phasianellus*), greater sage-grouse (*Centrocercus urophasianus*), wild turkey (*Meleagris gallopavo*), ring-necked pheasant (*Phasianus colchicus*), and gray partridge (*Perdix perdix*). The greater sage-grouse is considered a special status species and addressed in *Section 1.7, Special Status Species – Wildlife*, of the 2015 Proposed RMP/Final EIS. Sharp-tailed grouse is a BLM priority species for management because of public interest. Wild turkeys, ring-neck pheasants, gray partridges, and waterfowl are not a BLM priority species for management and will not be discussed further.

Sharp-tailed grouse are widely dispersed through the decision area. Identification of leks is ongoing, and many additional leks are suspected to occur on public land throughout the decision area. The primary threats to sharp-tailed grouse populations include habitat loss and degradation.

Fisheries and Aquatic Habitats

The aquatic resources include aquatic wildlife and habitat for fish, aquatic arthropods (insects and crustaceans), amphibians, reptiles, and bivalves. The habitat consists of rivers, streams, lakes, reservoirs, springs, and seeps that provide habitat for a variety of aquatic wildlife and riparian communities.

Special Status Mammals

There is no known habitat for special status mammals that overlap the area of coal potential.

Special Status Birds

A number of migratory bird species with habitat in the decision area are BLM sensitive species and are, therefore, managed as special status species according to BLM Manual 6840. These species include USFWS Birds of Conservation Concern, which have been identified as species that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) and are in greatest need of conservation action. There are 34 avian special status species in the decision area. This includes 30 BLM sensitive avian species, two USFWS endangered avian species (interior least tern and whooping crane), and two USFWS threatened avian species (piping plover and red knot). Detailed descriptions can be found in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Special Status Species (Avian) – Affected Environment,* pages 3-53 through 3-66).

Bald and Golden Eagle Nest and Roosts

Bald eagles are closely associated with water bodies to provide for their mainly fish diets. Golden eagles are wide ranging and can use a variety of habitats for foraging, including prairie, agricultural, and sagebrush communities. They require suitable cliffs or large trees for nesting. Eagle nests have been documented in the decision area. However, their status is unknown due to lack of survey data. Presently there are no identified eagle winter roost sites or concentration areas in the area of coal potential. (BLM 2015a; *Special Status Species (Avian) – Affected Environment*, page 3-53 through 3-66).

Prairie Falcon and Merlin

In general, merlins are not habitat specific and can be found in a variety of habitats, although they generally avoid dense forests or completely treeless regions. Breeding pairs in eastern Montana usually use sparse conifer stands of ponderosa pine adjacent to prairie habitats, but sometimes use shelterbelts and river bottom forests. The species has also been known to nests on cliff ledges, the ground, buildings, and in cavities in trees.

Prairie falcons are found in wide-open habitats, including sagebrush, prairie, agricultural fields, desert, and alpine meadows. They primarily uses cliffs for nesting, and grassland and prairie habitats for hunting. They rarely nest in trees, and most nests overlook at least some grassland or open habitat.

Greater Sage-grouse

Greater sage-grouse is a BLM sensitive species. In September 2015, the USFWS determined the greater sage-grouse no longer warranted protection under the ESA due to 98 separate federal land use plans that address conservation of the species.

The BLM formally began focusing on the conservation of greater sage-grouse with the issuance of the National Sage-grouse Conservation Strategy (BLM 2004). This effort was shorty followed by the state of Montana issuing the Management Plan and Conservation Strategies for Sage Grouse in Montana (Montana Sage Grouse Work Group 2005). In September 2015, Montana Executive Order 12-2015 was signed with the intent that the Montana Sage-Grouse Habitat Conservation Program is consistent with the efforts of the State of Wyoming implementation of the Greater Sage-Grouse Core Area Strategy. The Montana Greater Sage-Grouse Stewardship Act and Montana Executive Order 12-2015 together comprise the Montana Sage-Grouse Conservation Strategy. Since its commencement in 2016, the BLM has determined that this strategy is operational, effective, and consistent with all BLM goals and objectives for greater sage-grouse conservation.

Special Status Fish

Listed species or priority species with essential habitat are blue sucker, paddlefish, pallid sturgeon, shortnose gar, sicklefin chub, and sturgeon chub. Pallid sturgeon are listed as endangered under the ESA. Essential habitat for paddlefish, shortnose gar, and sicklefin chub includes the Yellowstone and Missouri Rivers; essential habitat for blue sucker and pallid sturgeon includes the Yellowstone, Missouri, and Powder Rivers; essential habitat for sturgeon chub includes the Yellowstone, Missouri, Powder, and Little Powder Rivers. An important part of the essential fish habitat is the riparian areas bordering the rivers and not just the waterways themselves.

Migratory Birds

The BLM considered migratory bird species under criterion 14 of the unsuitability screen. Migratory birds with delineated habitat in the area of coal potential are whooping crane and least tern.

Threats to Wildlife, Including Aquatic and Special Status Species

Primary threats to fish and wildlife include habitat loss, degradation, and fragmentation. Multiple factors can contribute to adverse impacts on wildlife and fish habitat, such as development, conversion to agricultural use, reduced water quality, water uses, recreation, roads and other linear infrastructure, herbivore and livestock grazing, introduction of invasive species, drought, wildfire, and climate change.

3.5.2 Direct and Indirect Impacts

Analysis Methods

This analysis focuses on the impacts of coal leasing and development on federally designated critical habitat for threatened and endangered species (unsuitability criterion 9), falcon nesting sites (unsuitability criterion 13), migratory birds of high federal interest (unsuitability criterion 14), and species of high interest to the State and that are essential for maintaining these priority fish, wildlife, and plant species (unsuitability criterion 15). These are the only known wildlife resources present within the area of coal potential.

Because wildlife, including aquatic species and special status species, may be included under multiple unsuitability criteria and multiple-use criteria, the discussion below is by unsuitability criteria and multiple-use criteria instead of by species or habitat type.

Assumptions

- Effects on wildlife species are based primarily on potential effects on habitats on lands that the BLM manages.
- Short- and long-term surface disturbance are assumed to occur in vegetation types, in proportion to the availability of these vegetation types, in the decision area. Affected acreages for vegetation types are not absolute, but provide a means for relative comparisons among alternatives.
- Precise quantitative estimates of effects generally are not possible because the exact locations of future actions are not known, population data for wildlife species are often lacking, or habitat types affected by activities cannot be predicted.
- Because of the migratory nature and relative mobility of some special status wildlife species, actions on non-BLM-administered land affect these species more than other species. In the case of migratory species, effects on winter and migration habitats could adversely affect the viability of some species. The BLM assumes winter and migration habitats to be at least as important to long-term viability of these species as breeding and nesting habitats.
- Over the life of the RMPA, some species currently considered sensitive, or not formally included on the BLM sensitive species list, could be listed under the ESA. Some currently listed species could be delisted during the life of the plan. Most

species delisted or downlisted from federally proposed or candidate status will be included on the BLM sensitive species list.

- The USFWS could designate additional wildlife species as threatened or endangered as additional data are collected and evaluated. These species would be managed in accordance with the ESA and as directed by BLM management decisions.
- All known raptor nests and their activity in the last 7 years from the GIS database maintained by the BLM were used in the analysis. The BLM analyzed buffers associated with raptor nests in accordance with USFWS recommended spatial buffers to protect nesting raptors. The BLM analyzed nests of unknown raptor species as golden eagle nests when located in trees and as ferruginous hawk nests when located on the ground.
- The quality and quantity of big game crucial winter range (seasonal range) are generally considered to be the limiting factors on big game populations in the decision area. The ability of these areas to support wildlife populations is a factor in determining population levels.
- Natural variability in wildlife health, population levels, and habitat conditions will continue. Periods of mild or severe weather and outbreaks of wildlife disease or insects and plant diseases that affect habitat could affect wildlife population levels.
- For each alternative, changes to vegetation types, either in quantity, quality, or increased fragmentation, are compared with baseline conditions. Adverse and beneficial impacts on vegetation types (for example, wildlife habitats) are assumed to have a corresponding adverse or beneficial impact on wildlife species.
- Disturbance impacts on wildlife are evaluated by comparing them with current management practices in the decision area. Increased protections in time or space are beneficial; reduced protections result in adverse impacts.
- Management actions aimed at benefiting specific wildlife species can have adverse or beneficial impacts on other wildlife species.
- The BLM utilizes best available data, peer-reviewed science, management and conservation plans, research, and BLM directives, as appropriate, to guide fish, aquatic, and wildlife habitat management.
- Delineations of wildlife habitats (for example, grouse leks, crucial winter ranges, and raptor nests) would be modified based on habitat monitoring, wildlife population surveys, and other information provided by industry, the BLM, USFWS, and MFWP at the site-specific phase.

Indicators

- Acres acceptable for further consideration for coal leasing in mapped wildlife (including aquatic species and special status species) habitat, big game crucial winter ranges, and nest buffers

Effects Common to All Alternatives

Effects of coal leasing and development on wildlife, including special status species, are discussed in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Fish, Aquatic and Wildlife Habitat, Including Special Status Species – Environmental Consequences,* pages 4-105 through 4-131).

Impacts from potential coal development on wildlife, including aquatic and special status species, include habitat loss, habitat degradation, habitat fragmentation, injury and mortality from collision, and disturbance and displacement (especially during sensitive breeding or wintering periods).

Effects from coal exploration and development could affect fisheries and aquatic habitats through degradation of water quality. Erosion and runoff from surface disturbance from coal development could increase sedimentation in waterways, degrade aquatic and riparian vegetation, and contaminate water resources with hazardous materials. These impacts could reduce survivorship of fisheries and wildlife that depend on riparian and aquatic habitats. Understanding the importance of riparian and aquatic habitats and the difficulty of restoring these areas after disturbance, the BLM realizes the most effective conservation method is avoidance.

The BLM would evaluate areas proposed for coal development for unsuitability when a lease application is received, and therefore provide for future protection, conservation, or mitigation of wildlife habitat considered as unsuitable with or without exception. As described in **Chapter 2**, the difference in alternatives is the amount of area acceptable for further consideration for coal leasing. Actual acres of disturbance cannot be geographically determined at the planning level. This is because the RFD scenario does not differ among alternatives, and it is unknown where specific development would occur.

Under all action alternatives, the multiple-use screen would provide protections to species by making perennial waterways (including a 300-foot buffer) and adjacent riparian areas (including a 10-foot buffer), which are important habitats for numerous wildlife species and fisheries, unacceptable for further consideration for leasing. This would help protect habitat for species of high interest to the state (pallid sturgeon, shortnose gar, blue sucker, sicklefin chub, sturgeon chub, and paddlefish). Making riparian and wetland habitat unacceptable for further consideration for leasing would protect high recreational values and wildlife species of high interest to the state. Sport fish reservoirs would have a 0.25-mile buffer and would protect waterfowl, big game, and small game, camping, sightseeing, and other activities. It would also protect the surrounding banks and riparian vegetation to protect fish habitat and maintain wildlife recreational uses. The BLM anticipates these avoidances to reduce impacts on fish and aquatic-associated wildlife to negligible levels for all alternatives.

Criterion 9

Currently, there is identified federally designated critical, proposed, or essential habitat for least tern, whooping crane, and pallid sturgeon in the analysis area that would be subject to impacts from the proposed project. Under Alternative A, habitats for these species were not considered in the unsuitability coal screen because they were either not yet listed or the essential habitat was not yet identified. **Table 3-9** shows the acres of least tern, whooping crane, and pallid sturgeon in the analysis area under each alternative. Under Alternative C, both the least tern and pallid sturgeon would be fully protected from coal development.

Table 3-9
Criterion 9 Species Affected by Alternative

Species	3-County Analysis Area	Alternative B	Alternative C
Least tern (0.25-mile buffer of habitat)	800	0	0
Whooping crane (migration corridor)	108,190	50,530	320
Pallid sturgeon (0.5-mile buffer of habitat)	2,500	0	0

Regardless of the amount of federally designated critical, proposed, or essential habitat acceptable for further consideration for coal leasing, all these habitats would be determined unsuitable for surface mining, but with an exception. The exception would allow for coal leasing after consultation with the USFWS if the USFWS determines that the proposed activity is not likely to jeopardize the continued existence of the listed species and/or its critical habitat (43 CFR 3461.5(i)(2)).

Criterion 13

Under Alternative A, approximately 8,620 acres of federal lands with existing falcon nesting sites were acceptable for further consideration for coal leasing, but unsuitable for surface mining with exceptions, at the time of the 2015 Proposed RMP/Final EIS. Alternative B has 8,430 acres and Alternative C has 4,560 acres acceptable for further consideration for coal leasing.

All falcon nesting sites and associated 0.5-mile buffer would be considered unsuitable for surface mining with exception. Exceptions can occur if the BLM, after consultation with the USFWS, determines that all or certain stipulated methods of coal mining will not adversely affect the falcon habitat during the periods when the falcons use such habitat (43 CFR 3461.5(m)(2)). Therefore, no meaningful difference in falcon nesting site protection would occur at the planning level. Impacts on raptors, including eagles, would be avoided or minimized through nest buffers to negligible levels for all alternatives.

Criterion 14

Under Alternative A, no areas of high-priority habitat for migratory bird species of high federal interest were identified as unsuitable under criterion 14. The Montana Natural Heritage Program, in conjunction with federal, state, and local agencies, and other data providers, provides delineated habitats for migratory birds. Alternative B has 50,530 acres available within the impact analysis area; however, a maximum 5,640 acres could be disturbed. Alternative C has a maximum of 320 acres available. These areas would be unsuitable for surface mining with exception. d

The BLM may issue a lease with an exception where the BLM, after consultation with the USFWS, determines that all or certain stipulated methods of coal mining will not adversely affect the migratory bird habitat during the periods when the species use such habitat (43 CFR 3461.5(n)(2)). The potential impacts of coal leasing and development on migratory bird species would be the same across all three alternatives, because the unsuitability screen would prevent meaningful impacts on habitat under all alternatives or require further consultation.

Criterion 15

Criterion 15 considers federal lands with habitat for resident species of fish, wildlife, and plants of high interest to the state and that is essential for maintaining these priority wildlife and plant species; they are unsuitable for surface mining with stipulation. **Table 3-10** shows the acres of greater sage-grouse habitat management areas, fish habitat, big game crucial winter range, and sharp-tail and greater sage-grouse lek buffers in the analysis area under each of the alternatives.

Table 3-10
Criterion 15 Species Affected by Alternative

Species	3-County Analysis Area	Alternative B	Alternative C
Greater Sage-Grouse Habitat Management Areas	76,580	45,630	4,870
Greater Sage-Grouse Leks (3.1-mile buffer)	291,790	96,750	40,900
Sharp-tail Grouse Leks (2-mile buffer)	835,690	282,920	99,350
Fish Habitat (0.5-mile buffer of Yellowstone, Missouri, Powder, and Little Powder Rivers)	8,040	0	0
Big Game Crucial Winter Range	402,490	115,280	44,350

For criterion 15, Alternative A had 240,180 acres acceptable at the time of the 2015 Proposed RMP/Final EIS. With current information, Alternative B has 358,730 acres, and Alternative C has 115,350 acres identified as acceptable for further consideration for leasing but unsuitable with stipulation. However, since the coal RFD scenario does not differ among alternatives, 5,640 acres are forecasted for development under all alternatives. This represents the maximum potential disturbance to fish and wildlife resources listed in Table 3-10.

The species that fall under this criterion have reclamation as a stipulated method of coal mining under Alternatives B and C. This stipulation requires reclamation using an approved seed mix that is appropriate to the soil type(s) found within the disturbance area. The approved seed mix sets guidelines for the amount of seed needed per acre, based on the percentage of pure live seed. Additionally, it sets the number of species of grasses, forbs, and shrubs required for the specific soil type(s). This stipulation would ensure vegetation communities are restored in an efficient manner to provide quality native wildlife habitat. This would mitigate wildlife and fish habitat loss under Alternatives B and C. This stipulation is not included under Alternative A; therefore, wildlife and fish habitat would be slower to recover.

3.5.3 Cumulative Impacts

Although there are differences in the availability of acres over the entire coal development potential area, impacts on wildlife, including special status species, would not significantly differ between the alternatives due to the application of the same unsuitability criteria 9 through 15. Exceptions to unsuitability criteria 9 through 15 for special status species would require additional federal or state wildlife agency, or both, consultation, with appropriate measures to protect special status species at the project level.

Because the direct and indirect impacts under Alternatives B and C would be similar to those under Alternative A, the cumulative impacts would also be similar to those under Alternative A. One difference would be under Alternatives B and C site reclamation, as a stipulation under criterion 15, would rehabilitate priority and essential wildlife habitat more effectively than under Alternative A, which has no stipulations. Alternatives B and C would have less impacts on wildlife habitat than Alternative A over the long term. Cumulative impacts are described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Fish, Aquatic and Wildlife Habitat, Including Special Status Species – Cumulative Impacts,* pages 4-132 through 4-179).

3.6 CULTURAL RESOURCES

3.6.1 Affected Environment

This section incorporates by reference the affected environment described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Cultural Resources – Affected Environment,* pages 3-72 through 3-82). In addition, the BLM has prepared an updated compilation of current 2018 cultural resource site and inventory data, USGS coal potential data, and data related to coal screening (BLM 2019). There are approximately 2,635 recorded cultural resource sites within the coal development potential areas in Big Horn, Richland, and Rosebud Counties. Locations important to Native American cultural and religious uses are present in areas with coal potential as well as locations having cultural viewsheds. Finally, there are three National Historic Landmarks within the coal development potential areas in Big Horn, Richland, and Rosebud Counties, which are the three counties where the BLM anticipates development associated with existing coal leases.

3.6.2 Direct and Indirect Impacts

Analysis Methods

The analysis focuses on data available for the cultural resources' unsuitability criterion 7, which is assumed to represent the types of resources in the decision area in the future. Under Alternatives B and C, 99,050 acres would be unacceptable for further consideration for coal leasing under the multiple-use screen because of cultural resource viewshed concerns related to three battlefields. These areas are removed from further consideration for coal leasing under the multiple-use coal screen (Screen 3; **Appendix A**, **Section A.3.3**). Because these areas would be unacceptable for further consideration for coal leasing, there would be no impacts on those cultural resource viewsheds; therefore, they are not discussed further. Impacts under Alternative A are disclosed in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Cultural Resources – Environmental Consequences [Alternative E],* page 4-202).

Analytical Assumptions

- The degree of adverse impacts on cultural resource sites and the total number of sites adversely affected are directly correlated with the amount of surface disturbance or other disruptive activities allowed under each alternative. Reduction or elimination of land uses in a particular area would benefit cultural resources through a reduction in direct and indirect impacts on the resources.

- All surface-disturbing activities would require cultural resource inventories/surveys of affected sites before the initiation of surface-disturbing activities.[6]
- All surface-disturbing activities would avoid or mitigate impacts on historic properties. For analysis purposes, it is assumed that 10 to 15 percent of sites are, or have the potential to be, eligible for listing on the National Register of Historic Places (NRHP).
- Surface-disturbing activities could affect some cultural resources, especially buried cultural resources, because they are difficult to locate through surface inventory/surveys.
- Historic settings of cultural resources are sometimes important cultural resources that are included in the consideration of potential impacts on cultural resources.
- NRHP criteria are applied to evaluate significance, and NRHP eligibility will guide the management of cultural resources. Avoidance is the preferred mitigation choice for both eligible and not eligible cultural resources. Where cultural resources are present and where impacts on them are unavoidable, depending on the nature and value of the resource, data recovery, extensive recordation, or interpretive and education mitigation may be warranted.
- The BLM would consult with appropriate tribes, according to guidance set forth in BLM Manual and Handbook 1780, and relevant authorities listed therein. The BLM would do this to identify and address potential resource concerns likely to affect the access or availability of resources or locations important to traditional lifeways, including subsistence, economic, ritual, and religious resources and locations.

Indicators

- Acres acceptable for further consideration for coal leasing within historic lands or sites.

Effects Common to All Alternatives

Effects of coal potential leasing and development on cultural resources are discussed in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Cultural Resources – Environmental Consequences,* pages 4-193 through 4-199). Identifying lands as acceptable for further consideration for coal leasing does not grant any rights or authorize any activities directly affecting cultural resources. The impact analysis focuses on the potential future actions and disturbance forecasts. In all cases, before any ground disturbance or other future actions, further analysis and decision-making would be required, including cultural resource work or analysis related to meeting the requirements of the NHPA.

[6] This generally requires a Class III intensive field inventory of the affected area to identify and record significant cultural resources or historic properties within the area of potential effect. These efforts provide information for the development of prescriptive mitigation of impacts through avoidance or other measures where necessary, and minimize or eliminate the potential for unmitigated impacts on cultural resources. In areas with a high potential for buried resources, construction monitoring and open trench inspection are some of the methods used to discover and protect cultural resources not apparent from surface inventories.

Direct and indirect impacts on cultural resources include activities that would involve surface-disturbing activities, including damaging, destroying, or displacing artifacts and features. Indirect impacts on cultural resources would include changing the character of a property's use or physical features in its setting that contributes to its historic significance (such as isolating the property from its setting) and introducing visual, atmospheric, or audible elements that diminish the integrity of its historic features.

Before the BLM authorizes any undertakings, actions would be subject to cultural resources review and compliance with the Section 106 process of the National Historic Preservation Act through existing state and national BLM protocols and agreements with the SHPO and the Advisory Council on Historic Preservation. Areas proposed for coal development would be evaluated for unsuitability when a lease application is received. The difference in alternatives is the amount of area acceptable for further consideration for coal leasing. Actual locations and acres of disturbance cannot be geographically determined at the resource management planning level.

Alternative A

Alternative A would maintain the coal screen results used for the 2015 Proposed RMP/Final EIS (BLM 2015a; *Minerals Appendix*, page MIN-197). The BLM concluded that there were no lands within the coal areas that were listed on the National Register of Historic Places under screening criterion 7, Historic Lands and Sites. However, the BLM identified 8,610 federal coal acres overlain by sites considered eligible for listing on the NRHP, but not formally nominated. These coal lands were declared unsuitable under this criterion. A maximum of approximately 5,640 acres is forecasted to be disturbed under Alternative A. Potential direct and indirect impacts would be the same as those described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Cultural Resources – Affected Environment* and *Environmental Consequences*, pages 3-72 through 3-82, pages 4-193 through 4-199, and page 4-202).

Alternative B

Under Alternative B, three National Register of Historic Places-listed properties (Lee Homestead, Bone Brothers Ranch, and Deer Medicine Rocks) are within the area acceptable for further consideration for coal leasing. Criterion 7 includes an exception for coal leasing and development. It would require consultation with the Advisory Council on Historic Preservation and the SHPO to mitigate impacts on these properties. The impacts would be a reduction from Alternative A because of the increase in acres unacceptable for further consideration for coal leasing under the multiple-use screen associated with the three battlefields and areas identified as unsuitable without exceptions. There would be a reduction in the potential for impacts from coal when compared with Alternative A.

Alternative C

Under Alternative C, one National Register of Historic Places-listed property (Lee Homestead) is within the area acceptable for further consideration for coal leasing. Criterion 7 includes an exception for coal leasing and development. It would require consultation with the Advisory Council on Historic Preservation and the SHPO to mitigate impacts on these properties. The impacts would be a reduction from Alternative A because of the increase in acres unacceptable for further consideration for coal leasing under the multiple-use screen and areas identified as

unsuitable without exceptions. There would be a reduction in the potential for impacts from coal when compared with Alternative A.

3.6.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to have significant impacts on known and undetermined historic properties in the planning area. Cumulative impacts for Alternative A are described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Cultural Resources – Cumulative Impacts [Alternative E]*, pages 4-202 through 4-204). Cumulative impacts for Alternatives B and C would be less than those under Alternative A.

3.7 LANDS AND REALTY

3.7.1 Affected Environment

This section incorporates by reference the affected environment described in the 2015 Proposed RMP/Final EIS (2015a; *Lands and Realty – Environmental Consequences*, pages 3-116 through 3-123). Existing infrastructure within the coal leasing action area primarily consists of local, state, and interstate roadways and other linear and nonlinear rights-of-way (ROWs).

3.7.2 Direct and Indirect Impacts

Impacts in this section focus on existing ROWs and easements (unsuitability criterion 2) and buffer zones along road ROWs (unsuitability criterion 3). Conservation easements would be unacceptable for further consideration for coal leasing under Alternatives B and C; they would not be affected further. Other types of ROWs and land tenure actions would not be different from those described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Lands and Realty – Environmental Consequences*, pages 4-304 through 3-335).

Analysis Methods

Assumptions

- Areas leased for coal are unlikely to be available for other ROW development.
- Under all alternatives, cities, cemeteries, and Interstate 90 would be unsuitable for surface coal mining with no exceptions (unsuitability criterion 3).

Impact Indicators

- Acres acceptable for further consideration for leasing within existing ROWs and associated buffers
- Acres foreseeably developed for coal mining

Effects Common to All Alternatives

Direct and indirect impacts on lands and realty would be as described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Lands and Realty – Environmental Consequences*, pages 4-202 through 4-204). Under all alternatives, 43 CFR 3461 coal unsuitability screening criteria 2 and 3 would result in certain ROWs, such as public roads, other lands within ROWs or easements, and lands within proximity to cemeteries, parks, and residential dwellings, to be unsuitable for coal development with exceptions.

There are ROWs present within the 5,640 acres of forecasted disturbance. Where those ROWs occur, they would be unsuitable unless one of the exceptions could be met. At the leasing stage, the BLM would review screening criteria based on the site-specific location of the lease, make a final unsuitability determination, and complete the appropriate impact analysis. If authorized, consultation with appropriate parties would determine the extent to which the authorized use would be mitigated as a result of coal development in those areas. If relocated, the result would be a similar infrastructure footprint, but in a different location.

3.7.3 Cumulative Impacts

Cumulative impacts on lands and realty would be as described in the 2015 Proposed RMP/Final EIS. Combined with past, present, and reasonably foreseeable future actions identified in the 2015 Proposed RMP/Final EIS, there could be the potential for an increasing number of ROWs in the MCFO planning area. However, screening criteria 2 and 3 would limit the potential for impacts on lands and realty under all alternatives.

3.8 ECONOMIC CONSIDERATIONS

Economic considerations are disclosed in this SEIS/RMPA as a result of the BLM updating the RFD scenario in response to the need to update the coal screening analysis. Based on information gathered from operators about existing mining operations in the MCFO and associated mine permits and lease applications received, the BLM updated the RFD scenario from what was considered in the 2015 Proposed RMP/Final EIS. Because of this, there is an updated economic forecast from what was disclosed in the 2015 Proposed RMP/Final EIS.

This section incorporates by reference the affected environment described in the 2015 Proposed RMP/Final EIS (BLM 2015a; *Social and Economic Conditions – Affected Environment*, pages 3-129 through 3-145). A summary as it pertains to the decisions for this SEIS/RMPA is included below. This section discloses the economic impacts of the actions considered in this SEIS/RMPA.

3.8.1 Affected Environment

The socioeconomic analysis area is defined as Big Horn, Richland, and Rosebud Counties within the jurisdiction of the BLM MCFO. In addition, Yellowstone County is included in this analysis per Montana intercounty commuting patterns for regional coal employment. Production analyzed in the socioeconomic analysis area is for surface coal mining operations.

The 2015 Proposed RMP/Final EIS (BLM 2015a; *Social and Economic Conditions – Affected Environment*, page 3-129 through 3-145) addresses the baseline demographic and economic information related to trends, populations, and economic sectors that can be affected by BLM-managed actions for the socioeconomic analysis area. Baseline demographic and economic information for Yellowstone County is available in the Billings Field Office Final EIS (BLM 2015b).

Coal Production

The US holds the largest single-region coal reserves in the world, accounting for approximately 30 percent of global reserves. National production has maintained at around 1,000 MMst per year from 1990 until 2015 (Hook and Aleklett 2009; CRS 2017; BGR 2017). US coal reserves are concentrated to three regions: the Appalachian coal region, Interior coal region, and the Western coal region, with each region containing coal producing basins (EIA 2018A). In 2017, US coal production was approximately 774 MMst (MSHA 2018). US coal reserves and changes

in domestic coal production trends are described in further detail in **Appendix D**, Supplemental Coal Market Report.

Montana is part of the Western coal region, the largest coal producing region in the US, which accounted for approximately 56 percent of total US coal production in 2017 (EIA 2018a). The Powder River Basin (PRB), within the Western coal region, is the largest coal producing basin in the US, accounting for approximately 71.4 percent of total coal production in the Western coal region and 43.2 percent of total coal production in the US (MSHA 2018; EIA 2018a). Given the proportion of production occurring in the PRB, the EIA and MSHA report coal production and employment data for the PRB and the remainder of the Western coal region separately (MSHA 2018). While Montana coal production primarily occurs within the PRB, coal production also occurs in areas defined by the EIA and MSHA as separate from the PRB, but within the Western coal region (MSHA 2018).

In 2017, the Western coal region produced a total of 403 MMst. Within the Western coal region, the PRB produced 334 MMst of surface coal, accounting for 43.2 percent of total US coal, out of 16 mines; the remainder of the Western coal region produced 68 MMst of surface and underground coal, accounting for 8.8 percent of total US coal, out of 20 mines (MSHA 2018).

In 2017, Montana was the sixth-highest coal producer in the United States, with approximately 35 MMst mined within the state (EIA 2018b; MSHA 2018). Historically, the Montana coal industry has been an important economic driver for the state, accounting for a total employment contribution of 6,588 jobs and generating approximately $774 million in total contributions to state gross domestic product in 2015 (National Mining Association 2016). Coal production in Montana also contributes to the Montana Coal Severance Tax Trust Fund, which supports a variety of public infrastructure projects throughout the state (Montana Department of Commerce 2017; Montana Legislative Fiscal Division 2015). Information on the trust fund and other sources of statewide mineral revenues are described in further detail in the *Mineral Revenue* section.

In 2017, approximately 29 MMst of coal were produced within the socioeconomic analysis area of Big Horn, Richland, and Rosebud Counties. Approximately 69.7 percent of production in the socioeconomic analysis area occurred in Big Horn County (MSHA 2018). Of the total coal production in the socioeconomic analysis area, 58 percent came from coal mined on federal mineral estate (see **Appendix C** for more information on coal production in the decision area). **Table 3-11**, below, describes coal production in each county, the PRB, the remainder of the Western coal region (WCR) not including the PRB, and the state of Montana.

In 2017, the Spring Creek Mine Complex produced the most coal in the planning area, accounting for approximately 12.7 MMst, or 43.3 percent of the socioeconomic analysis area total (MSHA 2018). **Table 3-12**, below, presents 2017 coal production by mine.

Table 3-11
Socioeconomic Analysis Area Coal Production, 2017

Production Category	Big Horn County	Rosebud County	Richland County	PRB*	WCR*	Montana
Number of Mines	3	1	1	16	20	6
2017 Coal Production (MMst)	20.5	8.6	0.3	334.4	68.4	35.2

Source: MSHA 2018
*The PRB and WCR include mines that are not within the state of Montana. Four mines within the PRB are also within Montana. One mine within the remainder of the WCR is within Montana.

Table 3-12
Socioeconomic Analysis Area Production by Mine, 2017

Mine Name	County	2017 Coal Production (MMst)
Decker Mine	Big Horn	4.2
Absaloka Mine	Big Horn	3.6
Spring Creek Mine Complex	Big Horn	12.7
Savage Mine	Richland	0.3
Rosebud Mine & Crusher/Conveyer	Rosebud	8.6
Planning Area Total	**-**	**29.3**

Source: MSHA 2018

Recoverable reserves present the forecasted amount of coal that can be potentially recovered. In 2017, Montana had approximately 779 short tons of recoverable reserves, accounting for 4.8 percent of total US reserves, as reported by mines producing more than 25,000 short tons to the EIA (EIA 2018b). Given the percentage of coal production that occurs on federal mineral estate (58 percent) within the socioeconomic decision area, it is reasonable to believe that the majority of these recoverable reserves also exist in this area.

Capacity utilization rates represent the ratio of annual coal produced to annual productive capacity and help identify the operating rate of a coal mine. They identify the proportion of output realized given the constraints to mine inputs. In 2017, Montana's capacity utilization rate for surface coal production was 70.2 percent, which is higher than the US rate of 69.9 percent (EIA 2018b).

The BLM obtained the price of coal from the EIA minemouth price database. Coal prices were derived from the quality of the coal produced and the ease of the mineral's extraction. Since PRB coal has a lower heating value and can be mined from the surface relatively inexpensively, it commands a lower price than coal from other coal producing regions. In 2018, the average annual price for PRB coal was $13.22 per short ton (EIA 2019a). **Table 3-13**, below, shows the 2018 average coal prices by region. These prices do not include transportation costs, which can increase overall coal costs, especially if shipped to out-of-state plants.

Table 3-13
2018 Minemouth Prices by Region

Basin	Price per Short Ton (2018$)
Arizona/New Mexico	38.39
Northern Appalachia	53.21
Central Appalachia	79.10
Southern Appalachia	128.61
Eastern Interior	42.48
Rocky Mountain	39.03
Gulf	16.80
Powder River Basin	**13.22**

Source: EIA 2019a

Compared with other coal producing basins that provided low-sulfur, sub-bituminous coal in 2018, western Montana coal from the PRB had the second-lowest price in the United States; only Wyoming PRB coal held lower prices. The average price of Montana PRB coal, at $16.14 per short ton, was higher than the PRB average of $13.22 per short ton, while Wyoming PRB coal, at $13.10 per short ton, was lower than the PRB average (EIA 2019b). The average price of low-sulfur, sub-bituminous coal is available in **Table 3-14**, below.

Table 3-14
Low-Sulfur, Sub-Bituminous Price per Basin 2018

Basin	Price per Short Ton (2018$)
Washington/Alaska	39.05
Rocky Mountain	77.24
Wyoming PRB	13.10
Western Montana PRB	**16.14**

Source: EIA 2019b

Coal Employment

Employment levels varied across mines and counties in the socioeconomic analysis area. In 2017, a total of 894 were employed in the socioeconomic analysis area (MSHA 2018). The Rosebud Mine Crusher and Conveyer, located in Rosebud County, represented the majority of coal employment, accounting for 36.6 percent of coal employment in the socioeconomic analysis area (MSHA 2018). At the county level, Big Horn County held 553 coal jobs, Rosebud held 327 coal jobs, and Richland County held 14 coal jobs (MSHA 2018). See **Table 3-15**, below, for more information on employment distribution.

Table 3-15
Socioeconomic Analysis Area Employment by Mine, 2017

Mine Name	County	Average Annual Employment
Decker Mine	Big Horn	153
Absaloka Mine	Big Horn	139
Spring Creek Mine Complex	Big Horn	261
Savage Mine	Richland	14
Rosebud Mine & Crusher/Conveyer	Rosebud	327
Planning Area Total	**-**	**894**

Source: MSHA 2018

Coal employment data identify the relative intensity of the coal industry to total employment. In 2017, Big Horn County had the highest percentage of coal employment relative to total employment at 9.4 percent, while Richland County had the lowest at 0.2 percent of total employment in the coal industry (MSHA 2018; BEA 2019). For comparison, Montana had 0.17 percent of total employment in the coal industry, while the United States had 0.027 percent of the employed labor force in the coal industry (EIA 2018b; BEA 2019). While coal employment may not provide major employment contributions to state or national totals, they do provide a larger contribution to the counties within the socioeconomic area of analysis. See **Table 3-16**, below, for more detailed information on coal employment numbers.

Table 3-16
Socioeconomic Analysis Area Coal Employment Ratio, 2017

County	Coal Employment	Total Employment	Percentage Coal Employment
Big Horn	553	5,859	9.4
Richland	14	8,397	0.2
Rosebud	327	5,580	5.9

Source: MSHA 2018; BEA 2019; EIA 2018b

Location quotients identify the concentration of a particular industry in a specified region compared with a larger reference region. They determine which industries make a region unique, while also identifying regional export characteristics. Values of location quotients are calculated by comparing an industry's share of regional employment against the same industry's share of national employment and can be interpreted as the number of times more concentrated an industry is in a specified region compared with a larger reference region (Sentz 2011). In 2017, the coal industry in Big Horn County was almost 56 times more concentrated than the state of Montana, and over 349 times more concentrated than the United States. See **Table 3-17**, below, for more information.

Table 3-17
Socioeconomic Analysis Area Coal Location Quotient, 2017

County	Location Quotient to MT	Location Quotient to US
Big Horn	55.5	349.6
Richland	0.94	5.9
Rosebud	34.5	217.1
Montana	X	6.3

Source: MSHA 2018; BEA 2019; EIA 2018b

Mineral Revenue

Coal mining activities within the socioeconomic analysis area contribute to federal, state, and county fiscal revenues. This SEIS/RMPA discusses the current conditions of mineral revenues related to coal production within the decision area.

Coal production provides an important revenue source for Montana, accounting for $85.5 million, approximately 4.2 percent, of statewide revenue generation in 2018 through coal severance taxes and coal gross proceeds taxes (ONRR 2019a; Montana Department of Revenue 2018). These funds support state and local social services such as education, road maintenance, public services, cities, towns, special districts, and more.

County Coal Gross Proceeds Taxes

Counties in Montana impose a 5 percent flat coal gross proceeds on the taxable value of production, where gross proceeds are defined as the "number of tons multiplied by the contract sales price" (Montana Department of Revenue 2019; ONRR 2019a). Gross proceeds are applied before any costs or expenses are deducted from the total collected contract sale. Counties rely on gross proceeds taxes to support public and social support services. Changes in collected tax revenue may have disproportionate effects on local economies given the importance to the overall budget.

In 2017, coal production in Montana generated approximately $20,018,132 for Big Horn, Rosebud, and Richland Counties (MCC 2019).

Using US Mine Safety and Health Agency data, approximately $11,623,744 was generated for Big Horn County, $4,903,420 for Rosebud County, and $147,882 for Richland County.

State Mineral Revenues

The state of Montana imposes two forms of taxes on coal production: the resource indemnity and groundwater assessment tax and a coal severance tax. The resource indemnity and groundwater assessment tax is applied as 0.4 percent of the taxable value of production (ONRR 2019a). In 2017, statewide coal production contributed $1.8 million to Montana revenues (MCC 2019).

Coal severance taxes vary by quality and mining method; however, surface coal within the socioeconomic analysis area is taxed as 15 percent on the taxable value of production (ONRR 2019a). Article XI, Section 5 of the Montana state constitution requires that 50 percent of collected coal severance taxes be allocated to the Coal Severance Tax Trust Fund, which

supports renewable energy development projects, regional water systems, economic development opportunities, and state operated educational facilities (Montana Department of Commerce 2017; Montana Legislative Fiscal Division 2015). Collected end of year coal severance taxes from 2013 to 2018 are available in **Table 3-18**, below.

According to the Montana Coal Council, approximately $1.017 billion currently sits in the Montana Coal Trust Fund (MCC 2019).

Table 3-18
Montana Coal Severance Taxes

Fiscal Year	Fiscal Year-End (Millions)
2013	$54.5
2014	$56.8
2015	$61.8
2016	$54.5
2017	$55.4
2018	$58.3

Source: Montana Department of Revenue 2018

State Property Taxes
Montana imposes production property rents on coal mines located on state land. Rental rates on state land are prescribed at $3 per acre (ONRR 2019a).

Federal Revenues
Surface coal production on federal land in Montana is subject to a federal royalty rate, a rental rate, and abandoned mine land (AML) fees. Domestic coal producers are also required to pay a coal excise tax on production volume.

The revenue collected from the coal excise tax by the Internal Revenue Service (IRS) goes directly into the Black Lung Disability Trust Fund (BLDTF) to support medical services for miners with black lung disease (ONRR 2019c). Coal excise taxes were restructured at the beginning of calendar year 2019 to $0.25 per short ton of produced coal (minus the tonnage of moisture content) but may not exceed 2 percent of the market value of production (ONRR 2019c).

Federal royalty rates for surface coal production are prescribed as 12.5 percent of the taxable production value; however, under certain conditions, coal mines can negotiate lower effective royalty rates. As such, Montana reports an average federal royalty rate of 11.61 percent. The Office of Natural Resource Revenue returns 49 percent of revenues collected back to the states in which they were generated.

Federal coal leases are subject to annual rent payments equal to $3 per acre. AML fees are identified as $0.28 per short ton for surface mined coal (ONRR 2019a).

For the 2017 calendar year, the Office of Natural Resource Revenue collected approximately $32,577,732 in federal revenue from coal production in Big Horn and Rosebud Counties.

Approximately $32 million, or 99.7 percent of total federal revenue collected in the socioeconomic analysis area, came from federal royalties, while $101,015, or less than 1 percent, came from rental fees (ONRR 2019b). Big Horn County generated approximately $22,388,254 in federal revenue, Rosebud County generated $10,188,158, and Richland County generated $1,320 (MSHA 2018; ONRR 2019b).

3.8.2 Direct and Indirect Impacts

Coal production is driven by the market demand for coal in the US electric generation fuel energy mix. The nationwide demand for coal in the US electric generation fuel energy mix is expected to decrease between 2018, where coal accounts for 28 percent of the energy generation mix, and 2050, where coal accounts for 17 percent of the energy generation mix (AEO 2019). This is driven primarily by the large reserves and production of US natural gas, continuously low natural gas prices, and the shift toward natural gas as the fuel of choice for energy production.

The combination of a large supply and lower prices is expected to increase the percentage of US electricity generation fueled by natural gas-fired power plants, leading to the decreased competitiveness of coal-fired electricity generation and eventual retirements of less efficient coal plants (AEO 2019). Forecasted market demand for coal is described in further detail in **Appendix D**, Coal Market Supplementary Report.

While domestic coal market demand is expected to decrease over the planning horizon, production in the planning area is expected to peak in 2020, and then decrease through the foreseeable future (2038). This is due to global market demand. The Decker and Spring Creek Mine Complex, which account for approximately 57.5 percent of total coal production in the decision area regardless of mineral ownership, export on average 80 percent of produced coal to international markets. Direct and indirect impacts associated with decreased coal production in the socioeconomic analysis area are described in detail in this section.

Analysis Methods

Assumptions

- The RFD scenario would not change across alternatives although there are differences in the number of acres acceptable for further consideration for leasing. The current level of leases would support the rates of production.
- Federal, state, and local taxes will continue to be collected on coal produced in the socioeconomic analysis area.
- International, national, and regional market conditions will continue to affect the pace and timing of coal development in the decision area; these issues are outside the BLM's control.
- The 2017 coal production output per worker will hold constant over the 20-year planning horizon.
- There will be no disruptive changes to existing coal development technology.

- Future coal production being analyzed encompasses low-sulfur, sub-bituminous coal comparable with what is currently produced in analysis-area mines.

Indicators

- Employment supported by coal production
- Labor income supported by coal production
- Value added supported by coal production
- Tax revenue collected by federal, state, and county governments supported by coal production

Methodology

To calculate the economic contribution of forecasted federal coal production in the socioeconomic analysis area, an input-output model, Impact Analysis for Planning Model (IMPLAN), was used to estimate the economic activity supported by forecasted production levels. The IMPLAN model estimates the effects of changes in employment on economic indicators that follow from direct, indirect, and induced impacts.

For this analysis, direct effects can be described as the direct jobs and incomes associated with federal coal production. Indirect effects are the economic changes associated with backward-linked industries, such as the purchases made by suppliers to coal production in the planning area. Induced effects are the economic changes resulting from household spending from changes in household income. Taken together, these combined economic effects describe the contribution of employment shocks from changes in the level of coal production over the 20-year planning horizon. Effects are described in terms of output, income, and jobs.

The IMPLAN model was used to gather response coefficients, which are ratios that measure how employment, labor income, and output respond to a one job change in the coal sector. Baseline employment conditions were gathered from the US Mine Safety and Health Administration; forecasted federal coal production is available in **Appendix C**. The BLM estimated direct employment levels over the planning horizon by assuming the 2018 production output per worker would remain constant over the 20-year planning horizon. Monetary transfers in the form of taxes or fees were excluded from the IMPLAN analysis; however, these transfer payments are discussed in the *Mineral Revenue* section.

Direct, Indirect, and Induced Effects

Input-output models (i.e., IMPLAN) are static models that measures output in an economy at a point in time. The model is used to describe an economy at a single point in time, introduce a change to the economy, and evaluate the economy after it has responded to the change. Static models do not describe how an economy moves from one equilibrium to the next, and they assume there are no changes in wage rates, input prices, economic linkages, and property values.

IMPLAN can provide estimates on how economic indicators respond to a one job change in a specific sector of the economy through their response coefficients. By applying response coefficients to direct employment, the level of economic activity supported by forecasted coal production can be estimated.

The baseline economic condition is described for 2018 employment levels, wage rates, input prices, and economic linkages. Economic output is converted to a consistent dollar year (2018$ United States dollars) and reported as annual averages in 5-year increments over the planning horizon (2019–2023, 2024–2028, 2029–2033, and 2034–2038), as well as for the average effects for the 20-year horizon. These results are described in the tables below.

Over the course of the 20-year planning horizon, increased coal production is expected to result in increased employment in the coal sector within the socioeconomic analysis area. While forecasted coal production in the analysis area is expected to increase to its peak in 2020, it begins to decline through the remainder of the planning horizon; however, production levels are forecasted to remain higher in 2038 than they were in 2019. Coal production over the planning horizon is estimated to support an average of 1,960 direct, indirect, and induced average annual jobs in the socioeconomic analysis area. These jobs would support economic activity of approximately $152.2 million in average annual labor income and $733.9 million in average annual economic output. **Table 3-19**, below, describes the average annual direct, indirect, and induced effects over the 20-year planning horizon.

Table 3-19
Average Annual Economic Effects 2019–2038

Impact Type	Employment	Labor Income	Output
Direct Effect	754	$78,365,873	$512,974,756
Indirect Effect	528	$43,589,971	$132,462,459
Induced Effect	678	$30,202,414	$88,464,526
Total Effect	1,960	$152,158,259	$733,901,741

Forecasted coal production begins to increase over the first 5 years of the planning horizon, with production supporting approximately 2,057 direct, indirect, and induced average annual jobs. These jobs would support approximately $159.5 million in average annual income and $769.9 million in average annual output from 2019 to 2023. **Table 3-20**, below, shows the detailed effects.

Table 3-20
Average Annual Economic Effects 2019–2023

Impact Type	Employment	Labor Income	Output
Direct Effect	792	$82,147,534	$538,195,276
Indirect Effect	554	$45,748,237	$139,015,470
Induced Effect	710	$31,654,611	$92,723,152
Total Effect	2,057	$159,550,382	$769,933,898

Forecasted coal production for the socioeconomic analysis area reaches its peak in 2020 at 25.4 MMst and then falls to 21.6 MMst by 2027. The 21.6-MMst production level is forecasted to remain constant through 2038 (see **Appendix C**). Coal production from 2024 to 2028 is estimated to support approximately 2,009 direct, indirect, and induced average annual jobs in the socioeconomic analysis area. These jobs would support approximately $155.9 million in average annual income and $752.2 million in average annual output. **Table 3-21**, below, provides detailed effects.

Table 3-21
Average Annual Economic Effects 2024–2028

Impact Type	Employment	Labor Income	Output
Direct Effect	773	$80,348,275	$525,778,041
Indirect Effect	541	$44,672,295	$135,753,533
Induced Effect	695	$30,968,394	$90,706,242
Total Effect	2,009	$155,988,964	$752,237,816

Coal production is forecasted to remain constant at 2027 levels through the remainder of the planning period. While US domestic coal market demand is expected to decrease (AEO 2019), production levels at mines in the decision area are expected to be sustained through the US export market and global coal demand. No production changes are forecasted from 2027 through 2038; therefore, the average annual effects for the 2029–2033 and 2034–2038 5-year periods are the same.

Forecasted production is estimated to support approximately 1,888 direct, indirect, and induced average annual jobs. These jobs are estimated to support approximately $146.5 million in average annual income and $706.7 million in average annual output. **Table 3-22**, below, provides detailed effects for the 2029–2033 and 2034–2038 5-year periods.

Table 3-22
Average Annual Economic Effects 2029–2033 and 2034–2038

Impact Type	Employment	Labor Income	Output
Direct Effect	726	$75,483,842	$493,962,853
Indirect Effect	508	$41,969,676	$127,540,417
Induced Effect	726	$29,039,326	$85,214,355
Total Effect	1,888	$146,546,844	$706,717,626

Revenue Analysis

Information on collected taxes associated with coal production are discussed in the Affected Environment. The effects analysis provides a quantitative assessment of the impacts on federal, state, and local government revenues associated with production. This analysis is based on forecasted federal production volumes in the planning area.

Mineral revenues associated with coal production were calculated by estimating the taxable market value of coal production in the socioeconomic analysis area through federal coal production forecasts over the planning horizon. Coal price forecasts were calculated by taking EIA-forecasted high economic growth and low economic growth prices weighted by the volume of production.

County Gross Proceeds Taxes

Counties impose gross proceeds taxes on the short tons of coal produced by the contract sales. The county treasurer collects the taxes and disburses them proportionately to the appropriate taxing jurisdiction (Nowakowski 2018). Gross proceeds taxes were forecasted by applying the 5 percent flat tax rate to the forecasted market value of production. Approximately $17,427,594 in average annual county mineral revenues is forecasted to be generated over the 20-year

planning horizon. Forecasted gross proceeds taxes over the planning horizon in 5-year increments are available in **Table 3-23**, below.

Table 3-23
Total County Mineral Revenues (2018$)

5-Year Increments	Average Annual Gross Proceed Contributions	Estimated Total Production Gross Proceeds Tax Contributions
2019–2023	$18,281,480	$91,407,400
2024–2028	$17,863,662	$89,318,310
2029–2033	$16,782,616	$83,913,080
2034–2038	$16,782,616	$83,913,080
Planning Horizon Totals	**$17,427,594**	**$348,551,870**

State Revenues

State-level contributions were forecasted by adding the resource indemnity and groundwater assessment tax, the state severance tax, and the federal royalty disbursements. The severance tax and resource indemnity and groundwater assessment tax revenues were estimated by applying the severance tax rate to the forecasted market value of production. The ONRR collects 100 percent of federal royalties, but disburses 49 percent to the state where extraction occurs (ONRR 2019a). Approximately $86,053,623 would be generated in average annual state mineral revenues. **Table 3-24**, below, shows average annual state mineral revenues over the planning horizon in 5-year increments.

Table 3-24
Average Annual State Mineral Revenues

5-Year Increments	Federal Royalty Disbursements	State Severance Taxes	Resource Indemnity and Groundwater Assessment Tax	State Totals
2019–2023	$20,800,302	$54,844,440	$14,625,184	$90,269,926
2024–2028	$20,324,917	$53,590,985	$14,290,930	$88,206,833
2029–2033	$19,094,924	$50,347,848	$13,426,093	$82,868,866
2034–2038	$19,094,924	$50,347,848	$13,426,093	$82,868,866
Planning Horizon	**$19,828,767**	**$52,282,781**	**$13,942,075**	**$86,053,623**

Article XI, Section 5 of the Montana state constitution requires that 50 percent of collected state severance taxes are deposited in the statewide Montana Coal Severance Tax Trust Fund. Fund disbursements are described in the *Affected Environment*. Forecasted increases to the Montana Coal Severance Tax Trust Fund and average annual contributions over the planning horizon are described in **Table 3-25**, below.

Federal Mineral Revenues

Federal mineral revenues were calculated by estimating federal royalty collections, federal rents, and federal coal excise taxes. The ONRR collects 100 percent of federal mineral royalties and returns 49 percent to the state where extraction occurs. Of the 51 percent retained, approximately 40 percent of onshore revenues are sent to the reclamation fund, 10 percent are sent to the US Treasury, and 1 percent are retained for administrative purposes (ONRR 2019d).

Table 3-25
Montana Coal Severance Tax Trust Fund, 2019–2038

5-Year Increments	Average Annual Contributions to Montana Coal Severance Tax Trust Fund	Estimated Net Increases to Montana Coal Severance Tax Trust Fund
2019–2023	$27,422,220	$137,111,100
2024–2028	$26,795,493	$133,977,466
2029–2033	$25,173,924	$125,869,621
2034–2038	$25,173,924	$125,869,621
Planning Horizon Totals	**$26,141,390**	**$522,827,808**

Because this analysis assumes federal coal production would continue to be produced from recoverable reserves, annual rents are anticipated to remain constant at levels reported in the *Affected Environment*. Domestic coal producers are also required to pay a coal excise tax on coal production. The revenue that the IRS collects from the coal excise tax goes directly into the BLDTF to support medical services for miners with black lung disease (ONRR 2019c). Coal excise taxes were restructured at the beginning of calendar year 2019 to $0.25 per short ton of produced coal (minus the tonnage of moisture content) but may not exceed 2 percent of the market value of production (ONRR 2019c).

Average annual federal mineral revenues across the planning horizon would be approximately $26,349,245. **Table 3-26**, below, shows forecasted average annual federal collections in 5-year increments.

Table 3-26
Average Annual Federal Mineral Revenues

5-Year Increments	Coal Royalties	Rent Contributions	Coal Excise Tax Contributions	Federal Totals
2019–2023	$108,246,471	$101,015	$5,885,000	$27,635,309
2024–2028	$105,772,529	$101,015	$5,750,500	$27,006,021
2029–2033	$99,371,548	$101,015	$5,402,500	$25,377,825
2034–2038	$99,371,548	$101,015	$5,402,500	$25,377,825
Planning Horizon Totals	**$103,190,523**	**$101,015**	**$5,610,125**	**$26,349,245**

3.8.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions in and adjacent to the decision area have the potential to affect coal production outside of BLM management decisions.

In this analysis, induced effects, which are those occurring from changes in household spending as a result from changes in household income, are higher than indirect effects, which are those occurring from economic changes with backward-linked industries. This is partially due to the inclusion of Yellowstone County as part of the socioeconomic analysis area. The BLM included Yellowstone County due to intercounty commuting patterns for regional coal employment. While no coal production occurs in Yellowstone County, potential actions occurring in or adjacent to the decision area outside of BLM management that may affect coal production in Big Horn, Richland, or Rosebud Counties may disproportionately affect Yellowstone County due to employment patterns.

The BLM does not expect new coal mines on federal mineral estate in the decision area. New leases authorized in the decision area would maintain production at existing mines; however, future coal mining operations may be developed on private lands located adjacent to the decision area and on Indian lands located in the decision area.

Nonfederal coal accounts for approximately 42 percent of total coal production in Big Horn, Richland, and Rosebud Counties and employs workers from Yellowstone County. Direct spending and employment from nonfederal coal producers have additional direct, indirect, and induced economic effects that ripple throughout the state and local economies. Nonfederal coal production is not subject to federal royalty rates or federal rent; however, companies must pay corporate income taxes to the IRS and a coal excise tax upon mining. Current coal excise rates are $0.55 per ton of coal produced for subsurface mines and $0.25 per ton of coal for surface mines, but coal excise taxes are limited to 2 percent of the market value (ONRR 2019c). The IRS transfers collected funds to the BLDTF (ONRR 2019c). Changes in nonfederal production may have additional economic effects not described in the *Environmental Consequences*.

Coal market demand has the potential to vary from EIA forecasts based on market factors driving changes in demand for the domestic fuel generation energy mix. The abundance and low prices of natural gas are expected to reduce the demand for coal production for energy generation and lead to the retirements of less efficient coal plants through 2050. While global market demand is expected to increase, driven by coal-powered generation in China, India, and Southeast Area, US coal exports are not expected to increase due to competitiveness of suppliers closer to major global markets (AEO 2019; IEA 2019). More information on domestic and international coal markets is described in **Appendix D**, Coal Market Supplementary Report.

While the US coal market share is not expected to increase over the 20-year planning horizon of the SEIS/RMPA, the Decker Mine and Spring Creek Mine Complex are projecting increases in exported coal for the socioeconomic analysis area. Export-driven coal production would rely on regional competitiveness compared with global suppliers closer to major global coal consumers, such as China and India. Economic viability of export-driven coal production is also dependent on other factors outside BLM management decisions, such as exchange rates, trade barriers, and changes in transportation costs.

Forecasted reductions in coal demand for the fuel generation energy mix have the potential to reduce coal production in the socioeconomic analysis area. Reductions in coal production would be due to the inability of mines to compete for future coal supply contracts, which may lead to losses in employment, labor income, value added, and total economic output. Reductions in coal production would likely occur on mines producing lower-quality coal than the open market demands (IEEFA 2019). Collected fiscal revenues associated with coal production would also be reduced, and revenue losses may have disproportionate effects on counties in the socioeconomic analysis area that rely on coal revenues to support public and social services.

3.9 UNAVOIDABLE ADVERSE IMPACTS

Section 102(C) of NEPA mandates disclosure of "any adverse environmental effects which cannot be avoided should the proposal be implemented." These are impacts for which there are no mitigation measures or for impacts that remain even after the implementation of mitigation

measures. Implementation of the SEIS/RMPA and subsequent activity- or project-specific coal mining would result in unavoidable adverse impacts on some resources. The impacts resulting from implementation of the SEIS/RMPA are described in this chapter. As discussed, below, under the section on irreversible and irretrievable impacts, the specific nature and extent of the implementation-level impacts cannot be clearly defined due to unknowns regarding site-specific implementation and associated mitigation measures.

In general, development and surface-disturbing activities associated with coal mining would result in unavoidable adverse impacts, including soil compaction and erosion, the loss of vegetation cover, the spread of noxious weeds, disturbance to and displacement of wildlife, visual intrusions on the landscape, and the potential loss of cultural or paleontological resources.

3.10 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Section 102(2)(C) of NEPA and Section 1502.16 of the CEQ regulations for implementing NEPA require that the discussion of environmental consequences include a description of ". . . any irreversible or irretrievable commitment of resources which would be involved in the proposal should it be implemented."

Coal mining from lands acceptable for further consideration for coal leasing would result in the irreversible and irretrievable loss of those coal resources. In addition, coal mining development and surface disturbance would have potentially irretrievable and potentially irreversible effects on vegetation, wildlife habitat, and livestock grazing if reclamation efforts prove unsuccessful. Irreversible effects on soils and water quality could occur depending on the implementation of mitigation measures and their efficacy.

3.11 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Section 102(C) of NEPA requires discussion of the relationship between local, short-term uses of the human environment, and the maintenance and enhancement of long-term productivity of resources. "Short term" is defined as anticipated to occur within 1 to 5 years of implementation of the activity. "Long term" is defined as following the first 5 years of implementation but within the life of the SEIS/RMPA (forecasted to be 20 years).

Coal mining and the resulting surface disturbance would result in various short-term adverse impacts, such as increased localized soil erosion or damage to wildlife habitat.

Management actions and best management practices would minimize the effect of short-term uses and reverse the change during the long term; however, coal mining and the associated infrastructure could result in some long-term productivity impacts regardless of reclamation activities.

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Chapter 4.
Coordination and Consultation

4.1 Introduction

This chapter describes the public outreach and participation opportunities associated with developing this SEIS/RMPA. As part of the process, the BLM consulted and coordinated with tribes, government agencies, and other stakeholders.

The BLM conducts land use planning in accordance with NEPA requirements, CEQ regulations, and DOI and BLM policies and procedures for implementing NEPA. NEPA and associated laws, regulations, and policies require the BLM to seek public involvement early in and throughout the planning process. This is to develop a reasonable range of alternatives to the proposed actions and to prepare environmental documents that disclose the potential impacts of proposed actions and alternatives.

The BLM involved the public and other agencies by way of *Federal Register* notices, public and informal meetings, individual contacts, media releases, planning newsletters, and the Miles City SEIS/RMPA ePlanning website.[1]

4.2 Public Collaboration and Outreach

Public involvement is a vital and legal component of both the SEIS and RMPA processes. Public involvement vests the public in the decision-making process and allows for full environmental disclosure. Guidance for implementing public involvement under NEPA is codified in 40 CFR 1506.6, thereby ensuring that federal agencies make a diligent effort to involve the public in the NEPA process.

The BLM involved the public in the Miles City SEIS/RMPA during public scoping to determine the scope of issues and alternatives to be addressed in the SEIS/RMPA.

The public scoping phase has been completed and is described below; the public outreach and collaboration phases are ongoing throughout the SEIS/RMPA process. The public can obtain information on the SEIS from the BLM's ePlanning website.

[1] https://go.usa.gov/xmbE4

4.3 PUBLIC SCOPING

The purpose of the public scoping process is to identify issues and planning criteria that should be considered in the SEIS/RMPA and to initiate public participation in the planning process. Detailed information about public scoping can be found in the Miles City SEIS/RMPA Scoping Report (see BLM's ePlanning website).

4.3.1 Notice of Intent

The formal public scoping process for the Miles City SEIS/RMPA began with the publication of the NOI in the *Federal Register* on November 28, 2018 (FR Doc. 2018–25847); the BLM also posted the NOI on the ePlanning website. It notified the public of the BLM's intent to prepare an SEIS and potential amendment to the 2015 RMP to respond to the court's order. The NOI included a call for coal and other resource information, and identified revision topics. The scoping period lasted 30 days, ending on December 28, 2018.

4.3.2 ePlanning Website

The BLM maintains an ePlanning website (https://go.usa.gov/xmbE4) with information related to the development of the SEIS/RMPA. The website includes background documents, public meeting information, and contact information.

4.3.3 News Releases

During the public scoping period (November 28 to December 28, 2018), the BLM sent press releases to 39 media contacts, 2 television stations, and 2 radio stations in the decision area. These press releases announced public involvement opportunities and the scoping meeting. A complete list of media outlets where the BLM sent press releases is included as *Appendix B* of the scoping report.

4.3.4 Other Notifications

In addition to press releases, the BLM notified members of the public about the scoping process via newspapers, both in and outside the planning area. The newspapers published local and regional articles and news bulletins regarding some aspect of the SEIS/RMPA process.

4.3.5 Scoping Meetings

Following publication of the NOI for the Miles City SEIS/RMPA, the BLM conducted one scoping meeting in Miles City, Montana, on December 13, 2018. The meeting included a PowerPoint presentation describing the purpose of the SEIS/RMPA, the project approach, and opportunities for public involvement. Materials presented and additional information can be found in the scoping report.

4.3.6 Scoping Comments Received

The BLM received 32 unique written comment letters during the public scoping period (November 28 to December 28, 2018). These submissions contained 447 unique comments. Detailed information about the comments received and about the public outreach process can be found in the Miles City SEIS/RMPA Scoping Report. The issues identified during public scoping and outreach helped refine the list of planning issues, which guided the development of alternatives management strategies for the SEIS/RMPA.

4.4 PUBLIC COMMENTS ON THE DRAFT SEIS/RMPA

The BLM published a notice of availability for the Draft SEIS/RMPA in the *Federal Register* on May 17, 2019, which initiated the 90-day comment period. On July 17, the BLM hosted a public meeting at the Miles City Field Office to present the Draft SEIS/RMPA to the public and to solicit comments. Three members of the public attended the meeting.

Appendix E is a record of BLM responses to substantive comments.

4.5 LIST OF PREPARERS

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	Eric Lepisto	Acting Field Manager
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	Melissa Hovey	Physical Scientist – Air Quality, Wyoming State Office
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	Kevin Kovacs	GIS Specialist
	Chris Morris	Hydrologist
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	Ben Rice	GIS Specialist
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	Christiana Stuart	Fisheries Biologist
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Affiliation/Preparer	Name	Role
Environmental Management and Planning Solutions Inc. (EMPSi)	David Batts	Program Manager
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	Zoe Ghali	Socioeconomics
	Peter Gower, AICP, CEP	Lands and Realty
	Jenna Jonker	GIS
	Julie Remp	Wildlife and Special Status Wildlife
	Marcia Rickey	GIS
	Angelo Sisante	Socioeconomics
	Matthew Smith	Water Resources
Ramboll	Krish Vijayaraghavan	Air Quality and Climate Change
	Susan Kemball-Cook, PhD	Air Quality and Climate Change
	Ralph Morris	Air Quality and Climate Change
	Courtney Taylor	Air Quality and Climate Change

4.6 TRIBAL CONSULTATION

Consultation with Native American tribes is part of the NEPA process and a requirement of FLPMA. On November 19, 2018, the BLM MCFO sent letters to the following tribes, initiating government-to-government consultation. The BLM MCFO invited them to be cooperating agencies on the SEIS/RMPA and asked for comments during the scoping period. Tribes were also sent copies of the Draft SEIS/RMPA and Final SEIS/Proposed RMPA. The BLM will also send copies of the ROD/Approved RMPA. Only the Crow Creek Sioux Tribe responded. They had no comments at the time. During the public comment period on the Draft SEIS/RMPA, the Yankton Sioux Tribe provided feedback related to consultation and noted that they were opposed to any coal extraction. Government-to-government consultation would also occur at the project level.

- Cheyenne River Sioux
- Chippewa Cree
- Crow
- Crow Creek Sioux
- Eastern Shoshone
- Fort Peck, Assiniboine, and Sioux
- Lower Brule Sioux
- Mandan, Hidatsa, and Arikara Nation
- Northern Arapaho
- Northern Cheyenne
- Oglala Sioux
- Rosebud Sioux
- Standing Rock Sioux
- Turtle Mountain
- Yankton Sioux

4.7 COOPERATING AGENCIES

The BLM is the lead agency for the SEIS/RMPA. On November 26, 2018, the BLM wrote to 27 local, state, and federal agencies, inviting them to participate as cooperating agencies for the

SEIS/RMPA. Eight entities agreed to participate in the SEIS/RMPA as cooperating agencies. The BLM has held cooperating agency meetings throughout the process and will continue to meet with them throughout preparation of the Final SEIS/Proposed RMPA. The cooperating agencies are the following: USFWS, US Environmental Protection Agency, Office of Surface Mining Reclamation and Enforcement, Montana Department of Natural Resources and Conservation, McCone County, Sheridan County, Prairie County, and Rosebud County.

- Big Horn County Commission
- Carter County Commission
- Custer County Commission
- Daniels County Commission
- Dawson County Commission
- Fallon County Commission
- Garfield County Commission
- McCone County Commission
- Richland County Commission
- Roosevelt County Commission
- Powder River County Commission
- Prairie County Commission
- Rosebud County Commission
- Sheridan County Commission
- Wibaux County Commission
- Office of the Governor, Montana
- Montana Department of Agriculture
- Montana Department of Environmental Quality
- Montana Fish, Wildlife and Parks
- Montana Department of Natural Resources and Conservation
- Montana State Historic Preservation Office
- United States Army Corps of Engineers
- United States Department of the Interior – Bureau of Indian Affairs
- United States Department of the Interior – Office of Surface Mining and Reclamation
- United States Environmental Protection Agency, Region 8
- United States Fish and Wildlife Service
- United States Geological Survey Energy Resources Program

4.8 MONTANA STATE HISTORIC PRESERVATION OFFICE CONSULTATION

The BLM MCFO initiated Section 106 consultation with the State Historic Preservation Office under the National Historic Preservation Act,[2] in order to identify and protect cultural resources in the decision area. On June 7, 2019, the State Historic Preservation Office responded with concurrence that the action alternatives have the probability of direct and indirect effects on cultural resources and that some effects have the potential to be unmitigable.

4.9 US FISH AND WILDLIFE COORDINATION

On April 11, 2019, the BLM MCFO sent a letter to the USFWS to inquire whether reinitiation of the consultation that occurred for the 2015 RMP/EIS was necessary for this SEIS/RMPA. The

[2] Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of federally funded projects on historic properties.

biological assessment for the 2015 Proposed RMP/Final EIS had determinations of "may affect, not likely to adversely affect," for all ESA listed species, to which the USFWS concurred on July 10, 2015. The USFWS concurred with the BLM that reinitiation of consultation is not required for this SEIS/RMPA because: (1) all action alternatives and associated impacts under consideration in this SEIS/RMPA are equal in scope to, or are lesser in scope than, actions and impacts previously analyzed with regard to threatened and endangered species and critical habitat in the 2015 biological assessment; and (2) none of the criteria outlined in 50 CFR 402.16 regarding reinitiation are met. The USFWS is also a cooperating agency on this SEIS/RMPA, and coordination will continue through completion of the Final SEIS/RMPA.

4.10 AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE SEIS/RMPA ARE SENT

The following agencies and organizations will receive a copy of the Draft SEIS/RMPA, Final SEIS/Proposed RMPA, and RMPA/ROD.

- Big Horn County Commission
- Carter County Commission
- Custer County Commission
- Daniels County Commission
- Dawson County Commission
- Fallon County Commission
- Garfield County Commission
- McCone County Commission
- Richland County Commission
- Roosevelt County Commission
- Powder River County Commission
- Prairie County Commission
- Rosebud County Commission
- Sheridan County Commission
- Wibaux County Commission
- Office of the Governor, Montana
- Montana Department of Agriculture
- Montana Department of Environmental Quality
- Montana Department of Fish, Wildlife and Parks
- Montana Department of Natural Resources and Conservation
- Montana State Historic Preservation Office
- United States Army Corps of Engineers
- United States Department of the Interior – Bureau of Indian Affairs
- United States Department of the Interior – Office of Surface Mining and Reclamation
- United States Environmental Protection Agency, Region 8
- United States Fish and Wildlife Service
- United States Geological Survey Energy Resources Program

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Glossary

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Glossary

100-year floodplain. The 100-hundred year floodplain is the area inundated by the 100-year flood or the 1 percent annual exceedance probability flood. It is the flood event that has a 1 percent chance of being equaled or exceeded in any single year. It is often mistakenly thought of as the flood that occurs once every 100 years. In actuality, if one has a project located within the 100-year floodplain and the project life is expected to be 20 years, it would have an 18 percent chance of experiencing flood damage due to a 100-year flood. For a project with an anticipated life of 15 years, the chance of incurring flood damage due to a 100-year flood would be 14 percent.

1976 Federal Leasing Law. The 1976 Federal Leasing Law mandates that 49 percent of collected federal royalties are returned to the state where the natural resource extraction occurred. The remainder of the collected federal royalty rates is distributed to federal funds and administration fees.

Alluvial valley floor. An area of unconsolidated stream-laid deposits holding streams with water availability sufficient for sub irrigation or flood irrigation agricultural activities (P.L. 95-87).

Black Lung Disability Trust Fund. The Black Lung Disability Trust Fund was developed to ensure the coal industry bears the burden associated with providing black lung benefits.

Capacity utilization. Capacity utilization rates identify the ratio of annual coal produced to annual productive capacity and help identify the operating rate of a coal mine.

Coal excise tax. A production tax levied on domestic coal production within the United States. Revenue is collected by the IRS and funds the Black Lung Disability Trust Fund. Coal excise taxes were restructured at the beginning of calendar year 2019 to $0.25 per short ton of produced coal but may not exceed 2 percent of the market value of production.

Critical habitat. An area occupied by a threatened or endangered species "on which are found those physical and biological features: (1) essential to the conservation of the species, and (2) which may require special management considerations or protection" (as defined under the ESA of 1973).

Crucial habitat. Parts of the habitat necessary to sustain a wildlife population at critical periods of its life cycle. This is often a limiting factor on the population, such as breeding or winter habitat.

Crucial winter range. That portion of the winter range on which a wildlife species is dependent for survival during periods of heaviest snow cover.

Cultural resource. The present expressions of human culture and the physical remains of past activities, such as historic buildings, structures, objects, districts, landscapes, and archaeological sites. These resources can be significant in the context of national, regional, or local history, architecture, archaeology, engineering, or culture. They also may include sacred sites and natural features of landscapes that are significant to living communities.

Cultural viewshed. The geographical area that is visible from a location that contributes to the historic or cultural resource integrity of a historic property or cultural landscape values. It includes such information as whether the viewpoint or viewed landscape includes designated scenic or cultural features, historic properties, cultural landscapes, or other specially designated areas.

Greater sage-grouse habitat. A specific environment or set of environmental conditions suitable for occupancy by greater sage-grouse often typified by the presence of sagebrush. Sage-grouse habitat may be further defined by the season of use (i.e., winter, breeding, and brood rearing); each has its own set of different environmental conditions. Each planning area may further define seasonal habitat characteristics based on local ecological conditions.

- Winter: Greater sage-grouse select winter concentration areas where sagebrush is 10 to 14 inches above the snow, with a canopy ranging from 10 to 30 percent. Wintering areas may also be on flat to generally southwest-facing slopes or in areas where sagebrush height may be less than 10 inches (25 centimeters), but the snow is routinely blown clear by wind. In the most severe winter weather conditions, greater sage-grouse will often be restricted to tall stands of sagebrush usually located on deeper soils in or near drainages.
- Nesting: The most suitable nesting habitat includes a mosaic of sagebrush with horizontal and vertical structural diversity. A healthy understory of native grasses and forbs provides cover for concealment of the nest and hen from predators, herbaceous forage for pre-laying and nesting hens, and insects as prey for chicks and hens. Preferred nesting cover may vary dependent on local potential habitat conditions.
- Brood rearing: Early brood-rearing habitat must provide adequate cover (sagebrush canopy cover of 10 to 25 percent is preferable) adjacent to areas rich in forbs and insects to assure chick survival during this period. Typically, mosaics of upland sagebrush and other habitats (for example, wet meadows or riparian areas) together provide abundant insects and forbs for hens and chicks. All greater sage-grouse gradually move from sagebrush uplands to more mesic areas during the late brood-rearing period (3 weeks post hatch) in response to summer desiccation of herbaceous vegetation. These areas provide an abundance of forbs and insects for

both hens and chicks. Brood-rearing habitats can include sagebrush habitats as well as riparian areas, wet meadows, and alfalfa or other agriculture fields.

Gross proceeds tax. The county-level flat tax of 5 percent on the taxable value of production imposed by counties in Montana.

Habitat. In wildlife management, the major elements of habitat are considered to be food, water, cover, and living space. The definition includes the following two usages: a species-specific environment or environmental conditions suitable for occupancy by that species, or a particular land cover type that provides an environment or environmental conditions suitable for occupancy by many species.

Habitat connectivity. Landscape elements that connect similar patches of habitat in sufficient quantity and arrangement to allow for the movement of wildlife. These linkage zones are where species migrate and intermingle to ensure genetic interchange and, consequently, long-term survival.

Historic property. Cultural resources—such as historic buildings, structures, objects, districts, or archaeological sites—that are listed on, or eligible for inclusion on, the National Register of Historic Places.

IMPLAN. IMPLAN (Impact Analysis for Planning) is an input-output model designed to identify regional economic impacts in response to a change in the economy.

Input-output (IO). A linear, quantitative model that identifies and represents economic linkages between different branches of a regional economy. Input-output is a static model that measures output in a regional economy at a singular point in time in response to a change to that regional economy.

Lek. A traditional breeding area for greater sage-grouse and sharp-tailed grouse in which males assemble to establish dominance, display, and breed. Leks are also called dancing grounds or strutting grounds.

Location quotients. Location quotients are a regional economic measurement intended to identify the concentration of a particular industry within a specified region compared with a larger reference region.

Minemouth. Mine mouth electric plants are coal-burning electricity-generating power plants that purchase directly from coal mines. They report prices to the Energy Information Administration Agency within the US Department of Energy.

Montana Coal Severance Tax Trust Fund. Article XI, Section 5 of the Montana State Constitution requires that 50 percent of collected coal severance taxes be allocated to the Coal Severance Tax Trust Fund, which supports renewable energy development projects, regional water systems, economic development opportunities, and state-operated education facilities. Counties can take loans against the fund.

Municipal watershed. A watershed that serves a public water system as defined in Public Law 93-523 (Safe Drinking Water Act) or as defined in state safe drinking water regulations.

National Register of Historic Places (NRHP). A listing of resources that are considered significant at the national, state, or local level and that have been found to meet specific criteria of historic significance, integrity, and age.

Office of Natural Resource Revenue. The Office of Natural Resource Revenue is an office with the US Department of the Interior responsible for collecting, accounting, and verifying natural resource and energy revenues due to states, American Indians, and the US Treasury.

Qualified surface owner. Qualified surface owner means the natural person or persons (or corporation, the majority stock of which is held by a person or persons otherwise meeting the requirements of this section) who:

> (1) Hold legal or equitable title to the surface of split-estate lands
>
> (2) Have their principal place of residence on the land, or personally conduct farming or ranching operations upon a farm or ranch unit to be affected by surface mining operations, or receive directly a significant portion of their income, if any, from such farming and ranching operations
>
> (3) Have met the conditions of paragraphs (1) and (2) for a period of at least 3 years, except for persons who gave written consent less than 3 years after they met the requirements of both paragraphs (1) and (2). In computing the 3-year period, the BLM Authorized Officer shall include periods during which title was owned by a relative of such person by blood or marriage if, during such periods, the relative would have met the requirements of this section (43 CFR 3400.0-5).

Raptor. Bird of prey with sharp talons and strongly curved beaks (hawks, falcons, owls, and eagles).

Recoverable coal. For the purposes of this EIS, the estimate of acres of coal potential identified in Screen 1. The acreage of recoverable coal available for leasing is calculated by applying all four coal screens.

Recoverable reserves. Recoverable reserves represent the tonnage of coal that can be recovered from existing coal reserves at producing coal mines.

Resource indemnity trust and groundwater assessment tax. A tax the state of Montana collects on the gross taxable value of mineral production to fund a Montana Resource Indemnity Trust intended to reclaim land disturbed from natural resource extraction. This tax is applied to coal production.

Riparian. An area of land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lakeshores and streambanks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent on free water in the soil.

Royalty rate. The Office of Natural Resource Revenue collects federal royalty rates on minerals extracted on federal land. Federal royalty rates vary by state. Montana has a federal royalty rate of 12.5 percent; however, companies are allowed to negotiate lower effective rates upon securing leasing rights. In Montana, the average effective royalty rate is 11.61 percent.

Sagebrush habitat. A land cover type with sagebrush as the dominant plant species. Sagebrush habitat provides environmental conditions for many species associated with sagebrush for all or part of their life cycle. Examples of sagebrush-associated species include greater sage-grouse, sage sparrows, sage thrashers, and common sagebrush lizards.

Sage-grouse core area. MFWP core areas contain habitat associated with Montana's highest densities of sage-grouse (25 percent quartile), based on male counts, or sage-grouse lek complexes and associated habitat important to sage-grouse distribution. Core areas are consistent with priority habitat management areas.

Sage-grouse general habitat management areas. Areas with or without ongoing or imminent impacts containing sage-grouse habitat outside the priority areas. Management actions would maintain habitat for sustainable sage-grouse populations to promote movement and genetic diversity. Areas are delineated based on sage-grouse habitat.

Sage-grouse priority habitat management areas. Areas with limited impacts containing substantial and high-quality sage-grouse habitat that supports sustainable sage-grouse populations. Management actions would emphasize the protection and enhancement of sustainable sage-grouse populations. Areas are delineated using "key," "core," and connectivity data or maps and other resource information.

Section 106 process. Refers to a section of the National Historic Preservation Act of 1966 (NHPA) that requires federal agencies to take into account the effects of their actions on historic properties. The NHPA created the Advisory Council on Historic Preservation (ACHP) and authorized the ACHP to issue regulations governing the implementation of Section 106. These regulations are set forth in 36 CFR 800.

Section 7 consultation. The requirement of Section 7 of the ESA that all federal agencies consult with the USFWS or the National Oceanic and Atmospheric Administration Fisheries if a proposed action might affect a federally listed species or its critical habitat.

Sensitive species. Species designated by a BLM state director, usually in cooperation with the state agency responsible for managing the species and state natural heritage programs, as sensitive. They are those species that could become endangered in or extirpated from a state or within a significant portion of its distribution; are under status review by the USFWS or National Oceanic and Atmospheric Administration Fisheries; are undergoing significant current or predicted downward trends in habitat capability that would reduce the species' existing distribution; are undergoing significant current or predicted downward trends in population or density such that federally listed, proposed, candidate, or state-listed status may become necessary; typically have small and widely dispersed populations; inhabit ecological refugia or other specialized or unique habitats; or are state-listed but may be better conserved through the application of BLM sensitive species status.

Severance tax. Severance taxes are statewide taxes imposed on the extraction of natural resources intended for consumption. The severance tax for Montana is 15 percent for surface coal.

Special status species. Include the following: species that the Secretary of the Interior has officially proposed for listing as threatened or endangered, species the Secretary of the Interior has officially listed as threatened or endangered under the provisions of the ESA, species the USFWS or National Oceanic and Atmospheric Administration Fisheries designates as candidates for listing as threatened or endangered, species listed by a state in a category implying but not limited to potential endangerment or extinction, and sensitive species as designated by a BLM state director.

Ton. The equivalent of 2,000 pounds. All tons in this EIS are short tons.

Unacceptable. 43 CFR 3420.1-4e(3) states that "multiple land use decisions shall be made which may eliminate additional coal deposits from further consideration for leasing, to protect resource values of a locally important or unique nature not included in the unsuitability criteria." Multiple-use values may include possible oil and gas development, and soil, forest, wildlife, recreation, agriculture, air, and watershed resources. Lands with coal potential may be eliminated from further consideration for leasing where multiple uses conflict.

Unsuitable. Lands with coal potential are assessed with procedures outlined in 43 CFR 3461. Lands with coal potential may be eliminated from further consideration for leasing if determined unsuitable without exception pursuant to Section 522(b) of the Surface Mining Control and Reclamation Act. In accordance with 43 CFR 3461.2-1, the BLM could, based on additional site-specific surveys or changes in resource conditions, change the unsuitability determination of a given tract at the activity planning stage.

Vegetation community. An assemblage of plant populations in a common spatial arrangement.

Vegetation type. A plant community with distinguishable characteristics described by the dominant vegetation present.

Waterway. Any body of water including lakes, rivers, streams, and ponds whether they contain aquatic life.

Wetlands. Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and which under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wildlife habitat. A species-specific environment and environmental conditions suitable for occupancy by that species, or a particular land cover type that provides an environment and environmental conditions suitable for occupancy by many species.

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Appendix A
Coal Screening Process

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Appendix A.
Coal Screening Process

A.1 INTRODUCTION

As part of the land use planning process (regulated under 43 CFR 1600), surface management agencies are charged with filtering lands overlaying federally administered coal through four screens. These screens ultimately result in the allocation of lands as acceptable for further consideration for leasing and development, giving consideration to resource conflicts with coal development (43 CFR 3420.1–4(d)).

This appendix describes the coal screening process undertaken by the US Department of the Interior, Bureau of Land Management (BLM) for the Miles City Field Office (MCFO), complying with 43 CFR 3420.1-4(e). The screening process informs potential land use decisions regarding coal leasing availability under the alternatives analyzed in the MCFO Supplemental Environmental Impact Statement (SEIS) and Resource Management Plan Amendment (RMPA).

The BLM prepared resource management plans and supporting coal screens for the 1996 Big Dry RMP and 1985 Powder River RMP, which allocate federal coal in the planning area. The 2015 Proposed RMP/Final EIS carried forward these coal screening results. In other words, Alternative A represents the coal screen results from the Big Dry and Powder River RMPs. To date, 34,700 acres of BLM-administered federal coal have been leased under these plans in the MCFO.

The total acres acceptable for further consideration for leasing and development based on this coal screening process are in **Chapter 2**, **Table 2-1**, **Table 2-2**, and **Table 2-3**.

A.2 REGULATORY OVERVIEW

Federal coal is governed by Section 522(b) of the Surface Mining Control and Reclamation Act and by the Federal Land Management Policy Act and its implementing regulations at 43 CFR 3400 and 43 CFR 1600. One aspect of coal leasing governed under these regulations is land use planning (43 CFR 3420.1–4(d); 43 CFR 1610.7-1) and the review of federal lands for suitability for coal leasing (43 CFR 3461). These regulations identify certain lands as unsuitable for surface mining or surface mining operations because they contain significant values that conflict with coal development. These include components of the National Wildlife Refuge System, the

National System of Trails, and incorporated cities, towns, and villages, among other entities. Other unsuitability criteria include critical habitat for threatened and endangered species and cultural resources listed on the National Register of Historic Places.

The regulations at 43 CFR 3420 govern the land use planning process as it pertains to coal, including the four coal screens for identifying areas acceptable for further consideration for leasing and unsuitable for surface mining or surface mining operations (43 CFR 3420.1–4). Under this process, the BLM must complete the following:

1. Identification of coal with development potential—Lands determined to have development potential are considered acceptable for further consideration for leasing, and are applied to the remaining coal screens. Lands determined to not have development potential are eliminated from further consideration for leasing.
2. Application of unsuitability criteria—Lands with coal potential are assessed with procedures outlined in 43 CFR 3461. Lands with coal potential may be eliminated from further consideration for leasing if determined unsuitable without exception pursuant to Section 522(b) of the Surface Mining Control and Reclamation Act. In accordance with 43 CFR 3461.2-1, the BLM could, based on additional site-specific surveys or changes in resource conditions, change the unsuitability determination of a given tract at the activity planning stage.
3. Multiple-use conflict analysis—43 CFR 3420.1-4e(3) states that "multiple land use decisions shall be made which may eliminate additional coal deposits from further consideration for leasing, to protect resource values of a locally important or unique nature not included in the unsuitability criteria." Multiple-use values may include possible oil and gas development and soil, forest, wildlife, recreation, agriculture, air, and watershed resources. Lands with coal potential may be eliminated from further consideration for leasing where multiple uses conflict.
4. Surface owner consultation—This screen requires the BLM to consult with qualified surface owners whose land overlies federal coal with development potential. The BLM asks the qualified surface owners for their preference for or against offering the coal deposits under their land for lease. Lands with coal potential may be eliminated from further consideration for leasing based on qualified surface owner preference.

A.3 COAL SCREENING RESULTS

A.3.1 Screen 1—Coal Development Potential

To evaluate coal potential in the decision area, the BLM consulted with the Montana Bureau of Mines and Geology and the United States Geological Survey (USGS). The BLM and USGS reviewed available data from the USGS, which included data from the Montana Bureau of Mines and Geology; developed criteria for evaluating coal potential; and compared new models developed by the USGS with the USGS Powder River Basin Report from 2015. Drill hole locations from the USGS were reviewed initially for completeness and representativeness to determine what data gaps merited infilling with BLM data. The USGS's dataset was adequate for the coal model, because it covered much of the same geographic area as the BLM's drill hole

data and had similar informational value. The USGS drill hole data were correlated with coal beds, and a predictive model for coal potential was created.

The USGS recommended a set of criteria to define areas with coal potential and areas without coal potential based on coal content and coal accessibility. BLM geologists concurred with these thresholds. This methodology is materially the same as that used for the 2015 report. The BLM used this classification and methodology (which can be reviewed at the BLM Miles City Field Office) to identify the locations with coal potential under this screen.

There are approximately 11.7 acres of BLM-administered federal coal in the planning area. **Figure A-1** displays the results of Screen 1.

A.3.2 Screen 2—Unsuitability

The BLM interdisciplinary team of resource specialists reviewed available data and solicited expertise and data from state and federal agencies (the Montana Fish, Wildlife and Parks; Montana Department of Environmental Quality; US Fish and Wildlife Service; and USGS) to assess the applicability of each of the 20 unsuitability criteria to the decision area.

The acres designated unsuitable under each unsuitability criterion are tabulated under **Table A-1**. Areas identified as unsuitable under each unsuitability criterion are mapped in **Figures A-2** through **A-15**, **Attachment 1**. For each criterion, resources that trigger unsuitability are identified. Please note that the resources identified are not exhaustive of that type of resource in the decision area; they are only those resources that overlie areas with coal potential identified under Screen 1 (**Figure A-1**), which result in areas being identified as unsuitable for screen 2. Acreages are not additive across the table because of overlapping resources (for example, wilderness study areas that drive unsuitability are also managed as visual resource management Class I and, therefore, subject to both criteria 5 and 6). **Figure A-15** shows the aggregate result of Screen 2.

Table A-1
Screen 2 Results

Criterion Number	Criterion Name / Applicable Resources[1]	Acres Unsuitable
Criterion 1 *Figure A-2*	*Federal Land System* • Lewis and Clark National Historic Trail System	14,940
Criterion 2 *Figure A-3*	*Federal Lands within Rights-of-Ways* • Rights-of-way	38,610
Criterion 3 *Figure A-4*	*Buffer Zones along Public Roads, Schools, and Parks* • Parks • Cemeteries • Schools • Public roadways • Dwellings	41,740
Criterion 4 *Figure A-5*	*Wilderness Study Areas (WSAs)* • Terry Badlands WSA	15,600
Criterion 5 *Figure A-6*	*Scenic Areas* • Terry Badlands WSA	14,970

Criterion Number	Criterion Name / Applicable Resources[1]	Acres Unsuitable
Criterion 6	*Scientific Study*	0
Criterion 7 *Figure A-7*	*Historic Lands and Sites* • Battlegrounds • Listed Sites	8,640
Criterion 8	*Natural Areas*	0
Criterion 9 *Figure A-8*	*Federally Designated, Proposed, or Essential Critical Habitat for Threatened and Endangered Species* • Least tern • Whooping crane • Pallid sturgeon	124,480
Criterion 10	*State-listed Threatened and Endangered Species*	0
Criterion 11	*Bald and Golden Eagle Nest Sites*	0
Criterion 12	*Bald and Golden Eagle Roost and Concentration Areas*	0
Criterion 13 *Figure A-9*	*Falcon Cliff Nesting Sites* • Prairie falcon and/or merlin	13,290
Criterion 14 *Figure A-10*	*Migratory Birds of High Federal Interest*	118,500
Criterion 15 *Figure A-11*	*Habitat for Species of High Interest to the State* • Big game crucial winter range (mule deer, white-tailed deer, and antelope) • Shortnose gar, blue sucker, sicklefin chub, sturgeon chub, and paddlefish • Greater sage-grouse leks and habitat management areas (for example, priority habitat management areas) • Sharp-tailed grouse leks and buffer zones	1,165,850
Criterion 16 *Figure A-12*	*100-Year Floodplain*	4,710
Criterion 17 *Figure A-13*	*Municipal Watersheds*	9,760
Criterion 18	*National Resource Waters*	0
Criterion 19 *Figure A-14*	*Alluvial Valley Floors*	174,310
Criterion 20	*Tribal and State Proposed Criteria*	0

[1]This screen was only applied to lands within the coal development potential area.

Stipulation for Criterion 15

All of the species listed under criterion 15, Habitat for Species of High Interest to the State, have reclamation as a stipulated method of coal mining. This stipulation requires reclamation using an approved seed mix that is appropriate to the soil type(s) found within the disturbance area.

Stipulation

The holder shall seed all disturbed areas with the seed mix, as agreed upon by the BLM based on the soil type(s). There shall be no primary or secondary noxious weed seed in the seed mixture. Seed shall be tested, and the viability testing of seed shall be done in accordance with state law(s) and within 6 months prior to purchase. Commercial seed shall be either certified or

registered seed. The seed mixture container shall be tagged in accordance with state law(s) and available for inspection by the BLM Authorized Officer.

A.3.3 Screen 3—Multiple Use

In addition to the areas unsuitable under Screen 2, land use decisions to protect resources of high value to the public may eliminate additional coal deposits from further consideration. The BLM reviewed other resource values and land uses not addressed under the 20 unsuitability criteria; additional lands were determined unacceptable for further consideration for leasing.

After close review of resources in the decision area, and in consultation with state and federal agencies, the BLM identified a number of resources that are eliminated from further consideration for coal leasing under Screen 3 in this SEIS/RMPA. Approximately 95,100 acres were determined unacceptable for further consideration for leasing in the 1985 Powder River RMP based on concerns for wildlife, soils, forest, recreation, agricultural, and watershed characteristics.

Under Alternative B, the BLM considered an air resource criterion, but did not remove any areas as unacceptable for further consideration for leasing (see **Chapter 2**). Therefore, **Table A-2** applies to Alternatives B and C, with the exception of the air resource criterion, which applies only to Alternative C.

Table A-2
Screen 3 Results

Multiple-Use Screen	Acres Unacceptable for Further Consideration for Leasing
Cultural Viewsheds (Figure A-16)	99,050
Recreation Areas (Figure A-16) • Special recreation management areas (SRMAs)/Extensive recreation management areas (ERMAs) • Travel management areas (TMAs)	8,770
Areas of Critical Environmental Concern (ACECs) (Figure A-16)	1,410
Active Oil and Gas Wells (Figure A-17) • 0.5-mile buffer on active gas wells	55,500
Active Oil and Gas Units (Figure A-17) • All lands within an active oil and gas unit agreement (excluding coalbed natural gas units)	22,110
Perennial, Riparian, and Wetland Resources (Figure A-18) • 300-foot buffer on all perennial streams • 10-foot buffer on all riparian and wetland aquatic habitat	10,690
Fishing Reservoirs (Figure A-18) • 0.25-mile buffer on all sport fish reservoirs located on BLM-administered lands	830
Conservation Easements (Figure A-18)	1,840
Air Resources[1] *(Figure A-19)* • Excludes lands outside an 8-mile infrastructure area around existing mines	1,525,190

[1] The air resources multiple-use screen was only applied to Alternative C.

Cultural Resources

The landscapes of two National Register of Historic Places-listed properties (Rosebud Battlefield and Battle Butte) and two BLM-administered ACECs (Powder River ACEC and Reynold's Battlefield ACEC) would be adversely affected by coal leasing and potential development activity on visual settings integral to those resources and their value to the public. The BLM developed viewshed analyses from these sites to identify potential conflicts.

Recreation Areas

Recreational opportunities are available to the public on all BLM-administered lands with legal access. These lands can be designated as either an SMRA or an ERMA. There are also TMAs that require special management by the BLM. Potential conflicts between development of coal mineral resources and SRMAs, ERMAs, the Hay Draw TMA, and the Knowlton TMA warrant their designation as unsuitable.

ACECs

ACECs are unique to the BLM and can only be designated on BLM-administered surfaces. These areas require special management to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards (43 CFR Part 1610). An ACEC may emphasize one or more unique resources. Potential conflicts between development of coal mineral resources and two ACECs (Powder River and Reynold's Battlefield) warrant their designation as unsuitable.

Fluid Minerals

Coal development activities can compromise oil and gas well integrity and oil and gas infrastructure around active wells where the two overlap. Oil and gas development and current oil and gas agreements merit buffers on coal leasing availability to prevent such conflicts. The delineated areas, below, reflect the smallest area reliably needed to protect equipment, flow lines, and well integrity, based on an assumption that 1.0 square mile was the minimum amount of land needed to develop a coal mine. Coalbed natural gas units were excluded from the multiple-use screen due to the short project durations and the ability for coalbed natural gas and coal development to coexist. The delineated areas apply to all active wells and units, regardless of ownership.

- 0.5-mile buffer from all active oil and gas wells
- Existing oil and gas unit agreements (excluding coalbed natural gas units)

Wildlife

Potential conflicts between development of coal mineral resources and riparian areas, perennial streams, and sport fish reservoirs warrant their designation as unsuitable. These areas include:

- 300-foot buffer on all perennial waterways
- 10-foot buffer on all riparian and wetland aquatic habitat
- 0.25-mile buffer on all sport fish reservoirs located on BLM-administered lands

Conservation Easements

A conservation easement is a tool used between a volunteering landowner and a government agency to permanently limit uses of the land in order to protect its conservation values. The MCFO identified Montana Fish, Wildlife and Parks conservation easements within the planning area that protect natural resource values in the areas. Potential conflicts between development of coal mineral resources and conservation easements warrant their designation as unsuitable.

Air Resources

Alternative B considered a criterion for maintaining air quality standards as part of the multiple-use screen; however, existing data and modeling done for the 2015 Proposed RMP/Final EIS showed no air quality standards were exceeded based on the national ambient air quality standards under the Clean Air Act. Therefore, no resulting geographic area of land was designated not suitable for further leasing of coal.

Alternative C applied an air resources multiple-use criterion based on greenhouse gas emissions that would result from additional transportation to deliver coal to the existing infrastructure. The air resources criterion limits coal development to an 8-mile area around the four existing mines. The area encompasses existing transportation infrastructure (for example, haul roads, conveyor belts, and railroad loops) associated with load-out facilities at the existing mines.

A.3.4 Screen 4—Consultation with Qualified Surface Owners

The BLM sent letters to all identifiable surface owners with lands overlying BLM-administered federal coal in areas where the USGS was evaluating the coal potential. These letters requested that the surface owners confirm they are qualified to express their preference on mining federal coal (see 43 CFR 3400.0-5(gg)(1) and (2)). The BLM also asked that the surface owners respond with their preference for or against mining by other than underground methods (i.e., surface mining) on the BLM-administered federal coal beneath their land. A sample of the letters sent to private surface owners can be found in **Attachment 2**.

In order to be a qualified surface owner in accordance with the regulations at 43 CFR 3400.0-5, the individual(s) must:

1. Hold legal or equitable title to the surface of split estate lands
2. Have their principal place of residence on the land; personally conduct farming or ranching operations upon a farm or ranch unit to be affected by surface mining operations; or receive directly a significant portion of their income, if any, from such farming and ranching operations
3. Have met the first two conditions for a period of at least 3 years, except for persons who gave written consent less than 3 years after they met the requirements. In computing the 3-year period, the BLM Authorized Officer shall include periods during which title was owned by a relative of such person by blood or marriage if, during such periods, the relative would have met the requirements of this section

On January 28, 2019, the BLM mailed 6,552 letters to landowners where the USGS was evaluating the coal potential. The BLM requested a response by March 4, 2019. Responses received by March 4, 2019, were included in Screen 4 of the Draft SEIS/RMPA. The BLM

considered responses received from March 5 through August 15, 2019, during development of the Final SEIS/Proposed RMPA. In the letter, the BLM requested verification of landowner qualifications and an opinion on leasing federal coal beneath their surface (in favor, against, and undecided); the BLM also inquired if they have previously provided consent for surface mining. The BLM included an addressed, postage-paid envelope to encourage response. Of the 6,552 letters mailed, the BLM MCFO received 2,722 responses between January 28 and August 15, 2019. Of those responses, there were 778 qualified landowners within the coal development potential area (Screen 1).

The BLM identified lands as unavailable for further consideration for coal leasing under this screen only where a qualified landowner clearly stated that they were not in favor of leasing. All other lands were identified as available for further consideration for coal leasing under this screen. As a result of the landowner responses, the BLM MCFO removed 236,630 acres from consideration for coal leasing (**Figure A-22**). Landowner response letters are included in the project record.

At the time of coal leasing, the current landowner will need to provide written consent to mine, whether they have expressed an opinion in favor of or against leasing in this process (30 United States Code 1304).

A.4 REFERENCE

BLM GIS. 2019. GIS data on file with the BLM's eGIS server, used for calculations or figures related to the coal development strategy. BLM, Miles City Field Office, Montana.

Attachment 1

Figures

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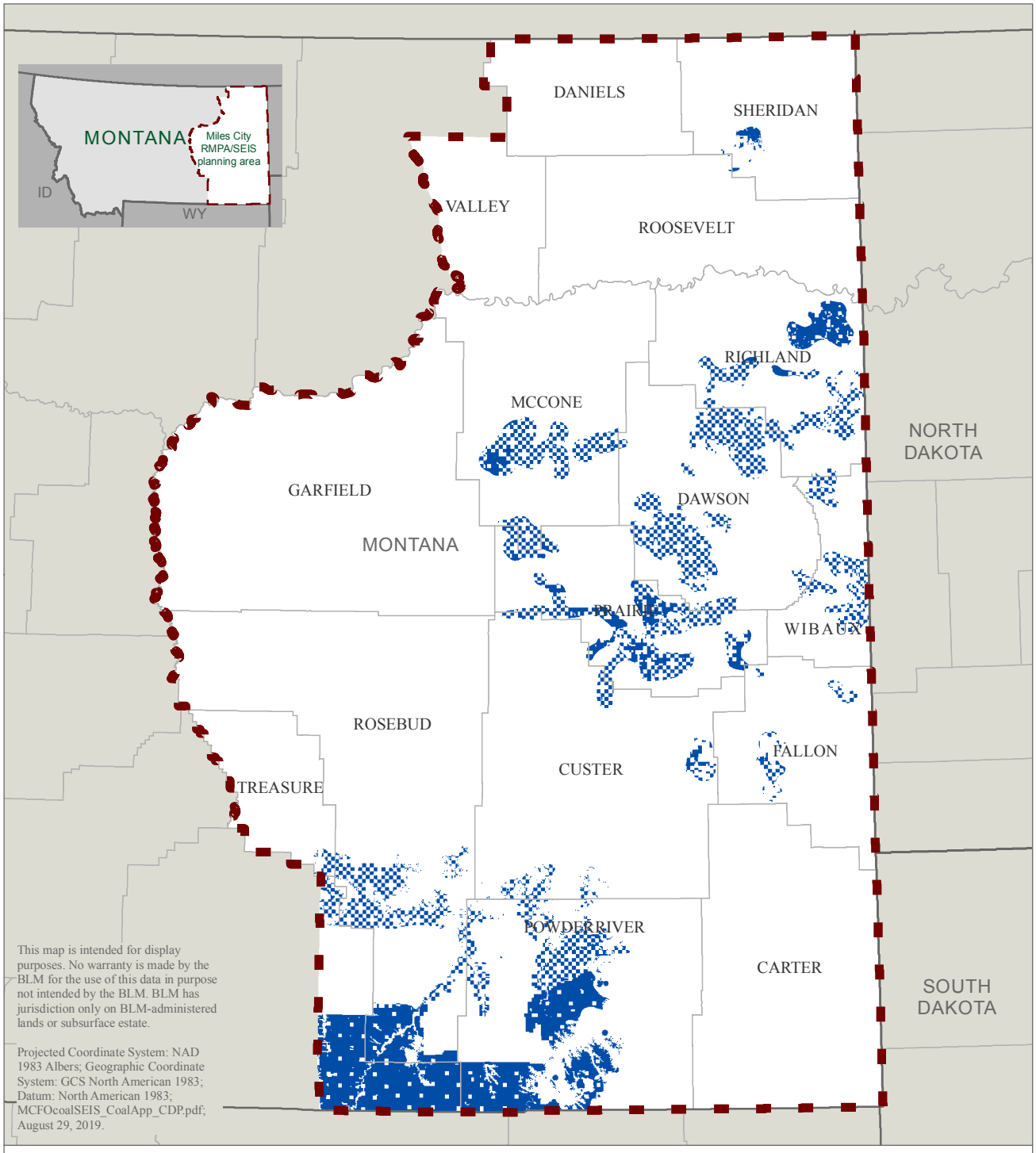

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1 inch = 39.3 miles

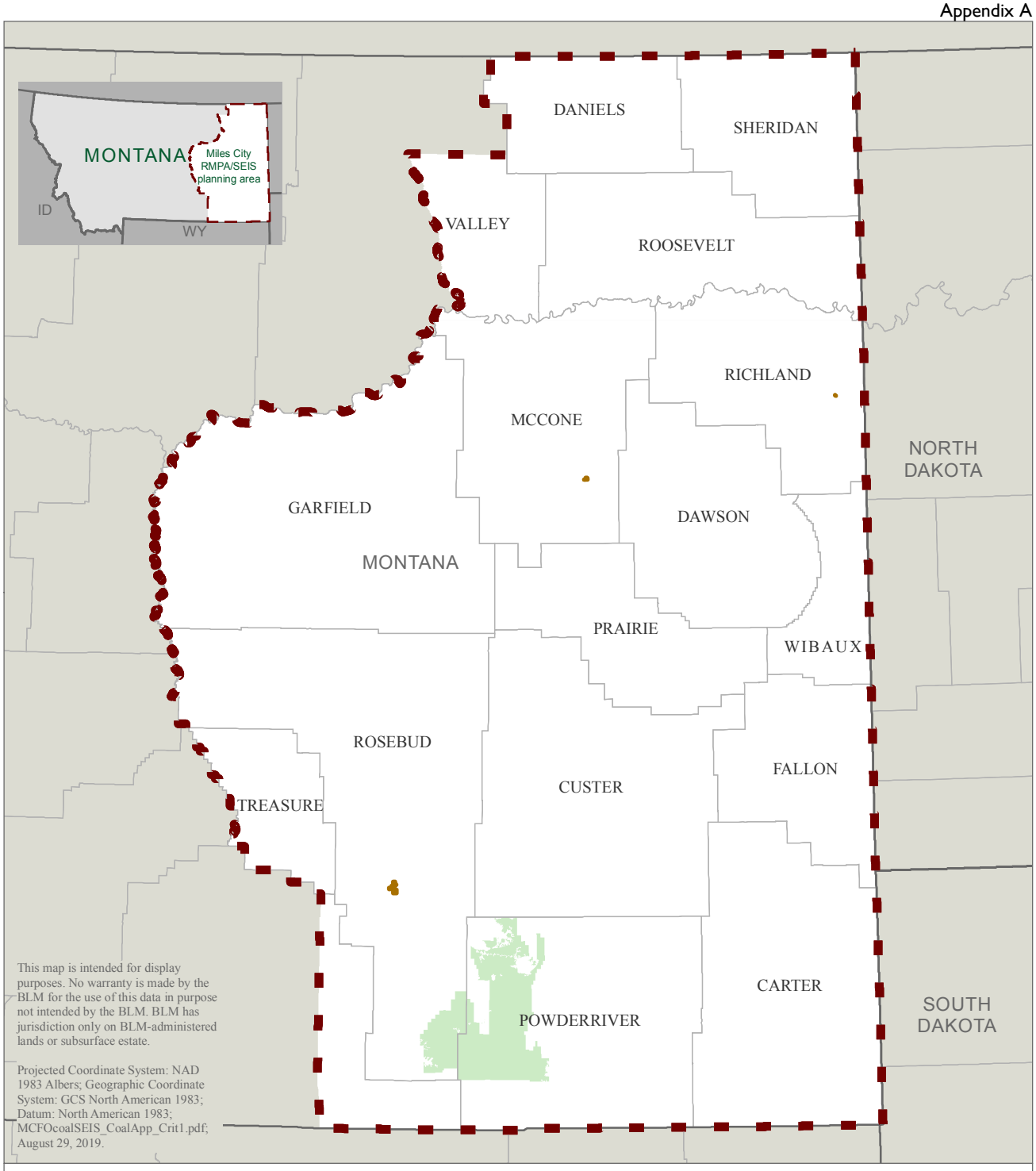
0 5 10 20 30 Miles

Figure A-1

Screen 1
Coal Development Potential

Coal development potential

Subsurface federal mineral coal estate



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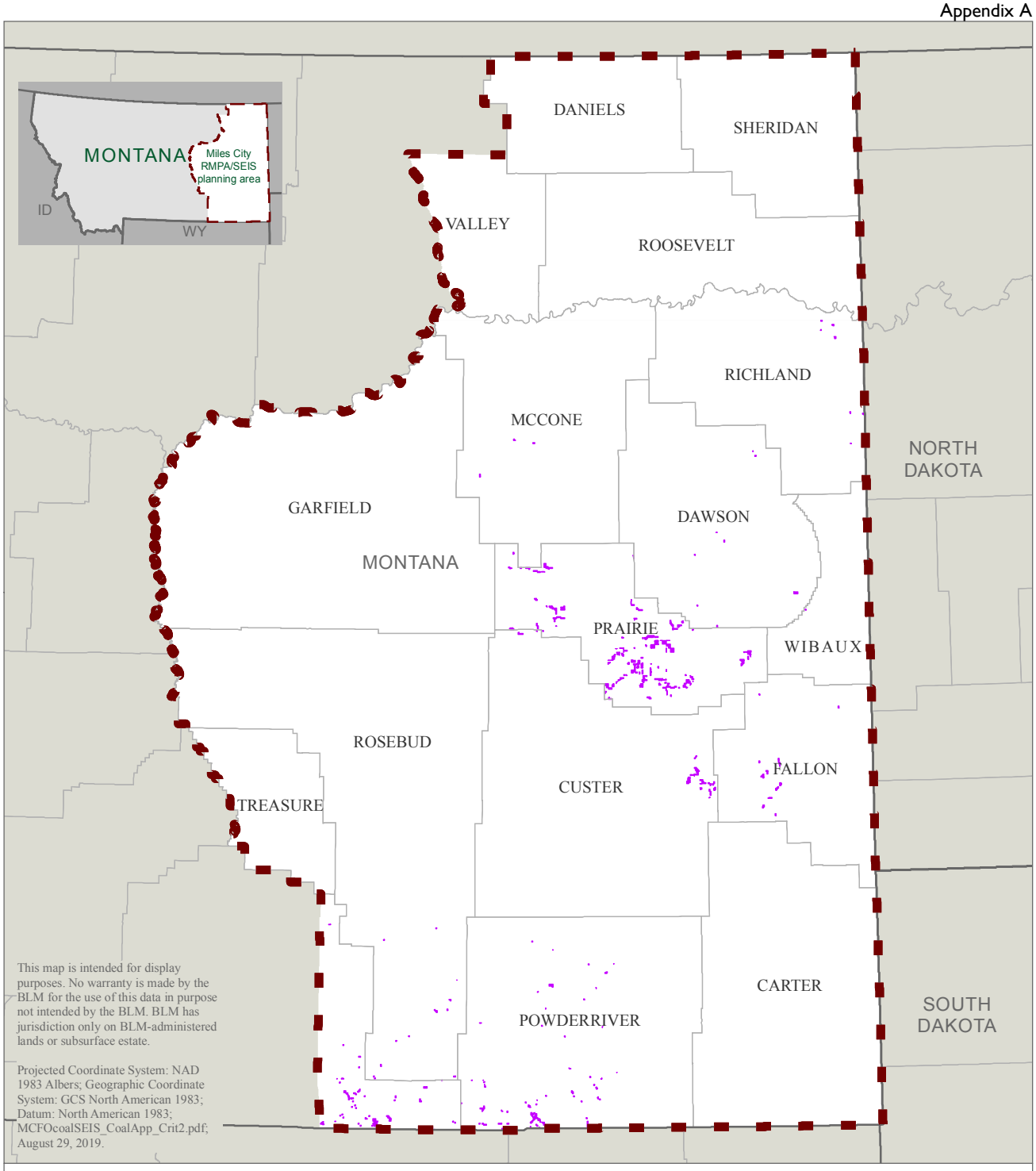
1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-2

Screen 2 Criterion 1 (Without Exception)—Federal Land System

- Incorporated area
- US Fish and Wildlife Service
- US Forest Service



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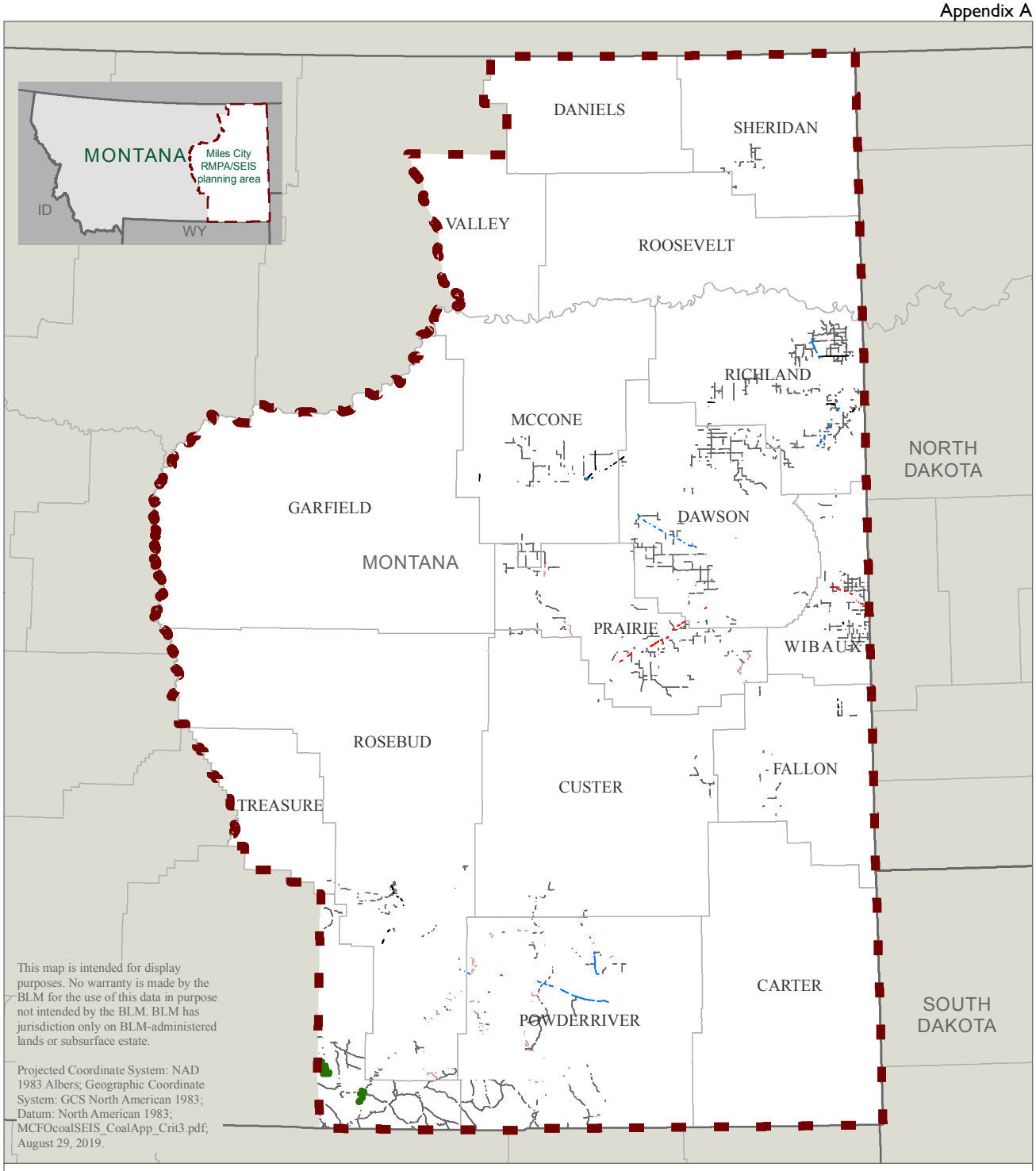
1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-3

Screen 2 Criterion 2 (With Exception)—Federal Lands within Rights-of-Ways

Rights-of-way



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MILES CITY FIELD OFFICE

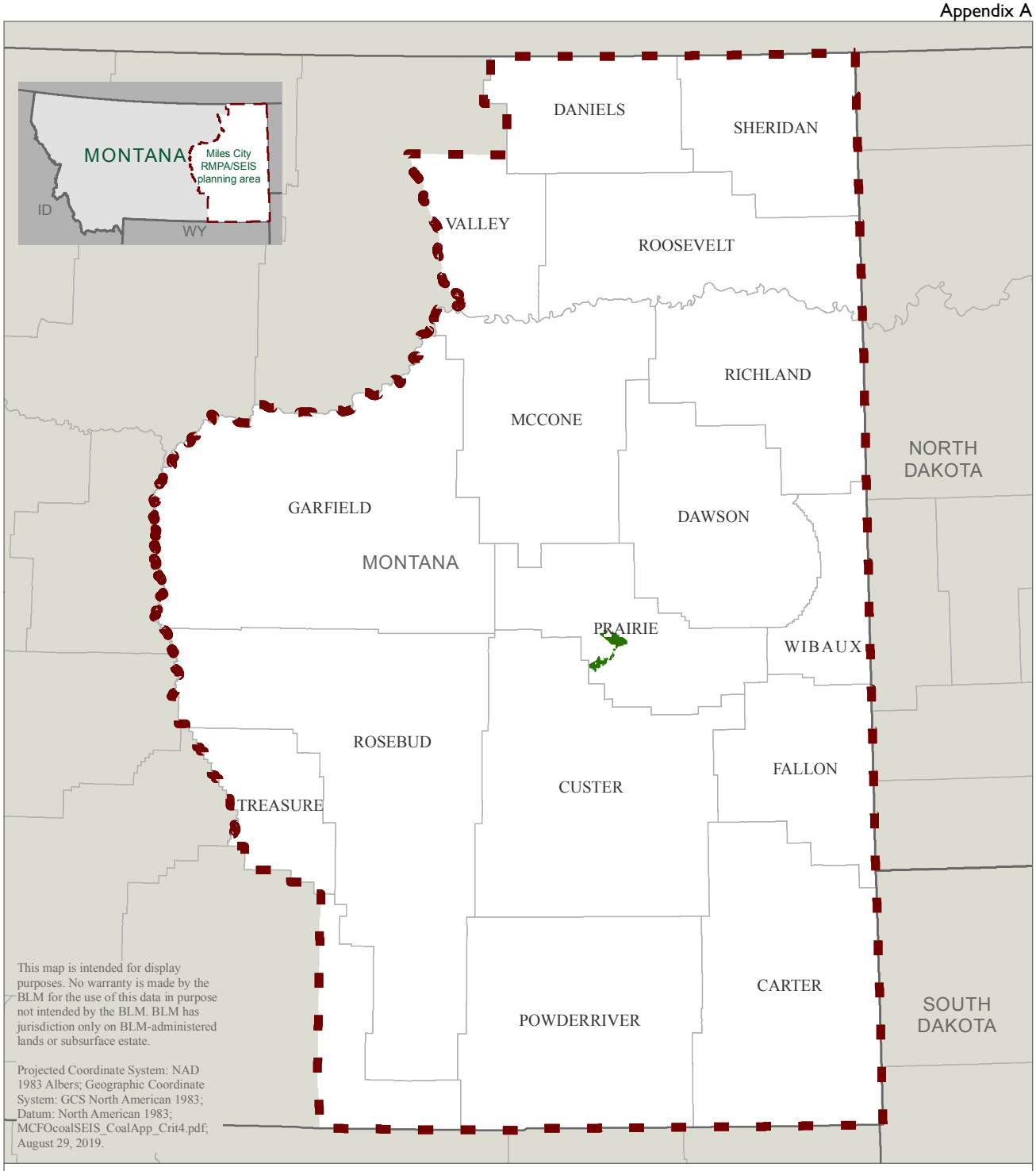
1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-4

Screen 2 Criterion 3 (With Exception)—Buffer Zones along Public Roads, Schools, and Parks

- State park
- Interstate
- Major highway
- Primary road
- Public road
- Agency road



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1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-5

Screen 2 Criterion 4 (Without Exception)—Wilderness Study Areas

Terry Badlands Wilderness Study Area

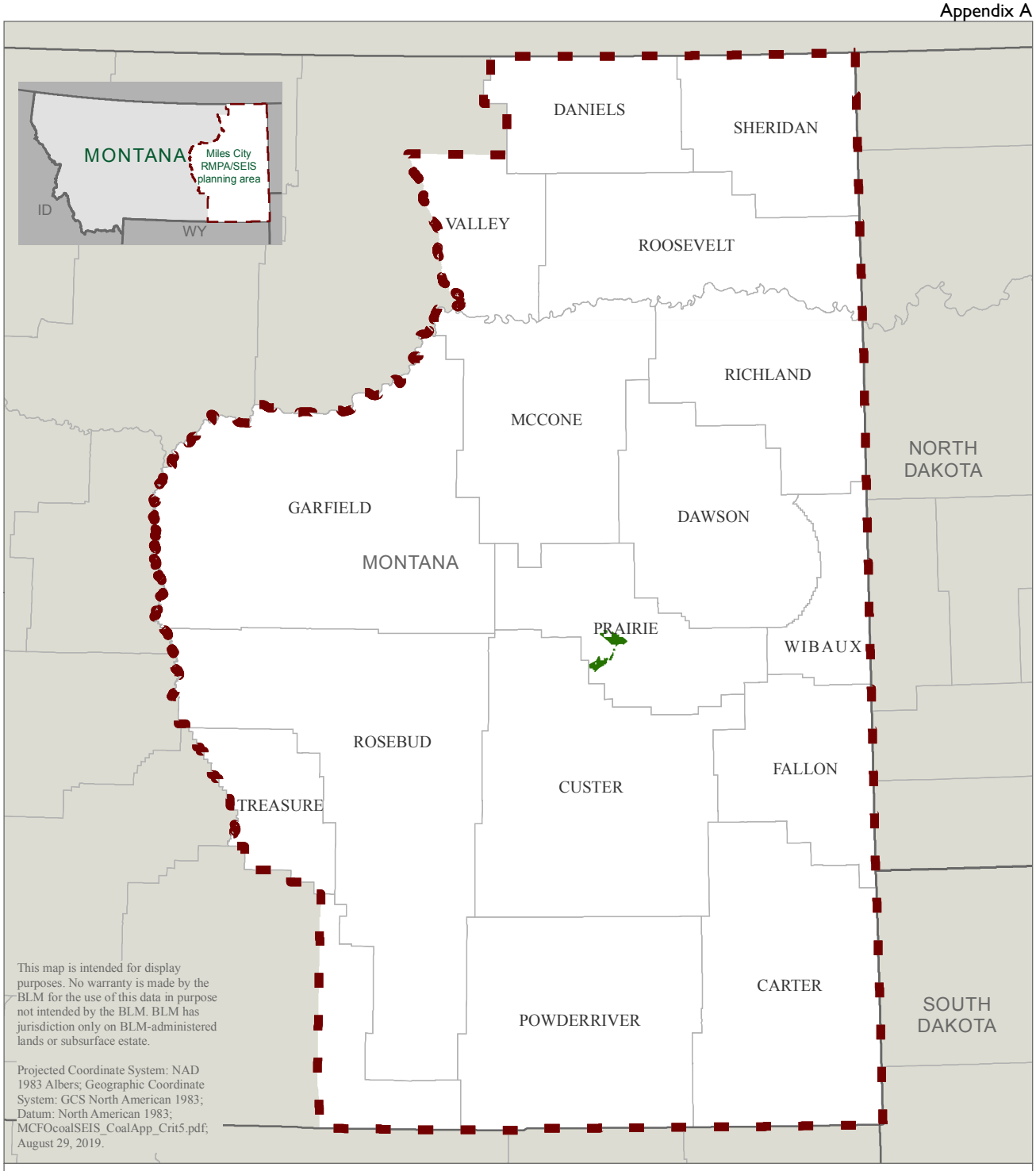

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Figure A-6

Screen 2 Criterion 5 Scenic Areas (With Exception)

Terry Badlands Wilderness Study Area

1 inch = 39.3 miles

0 5 10 20 30 Miles

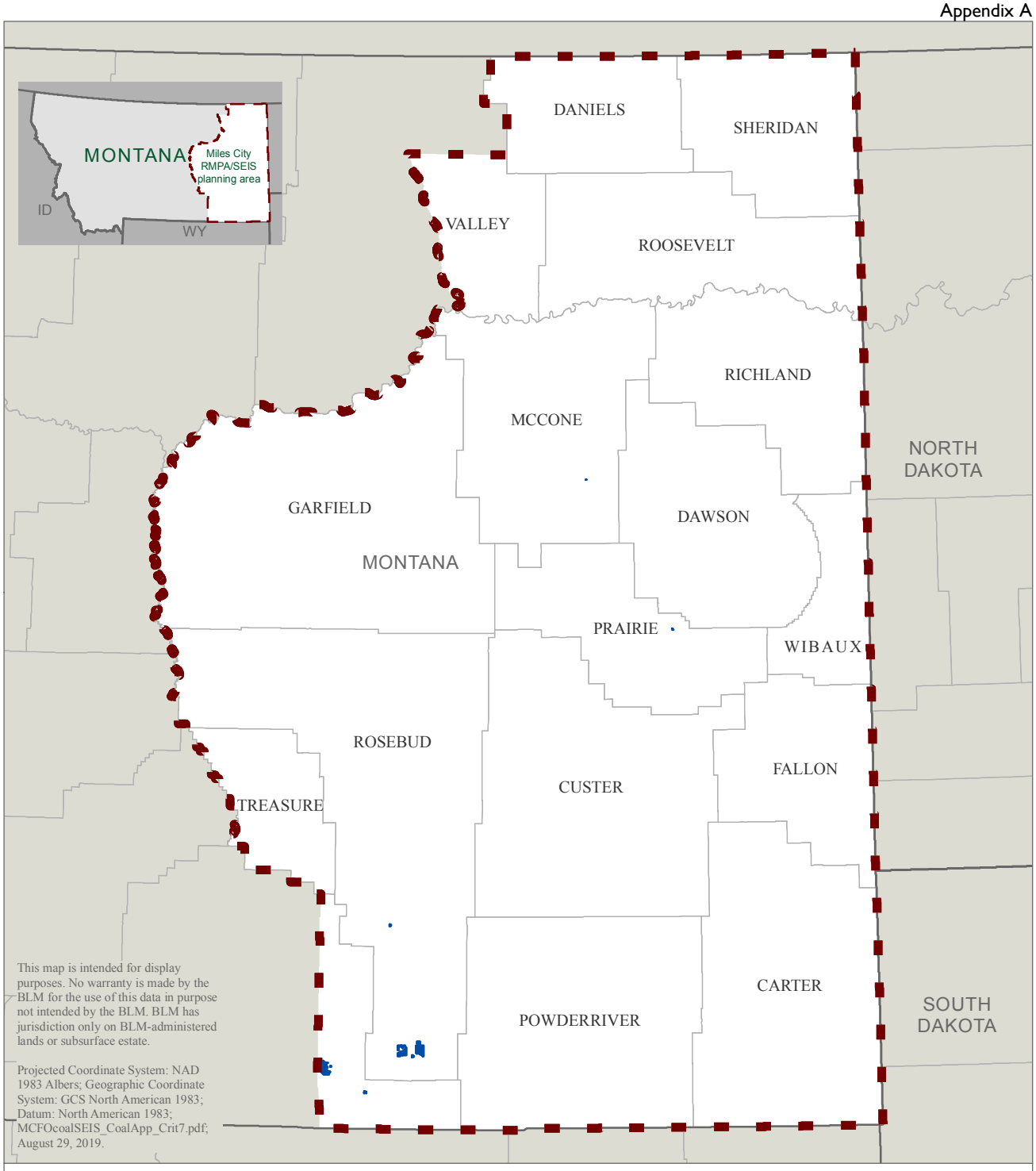

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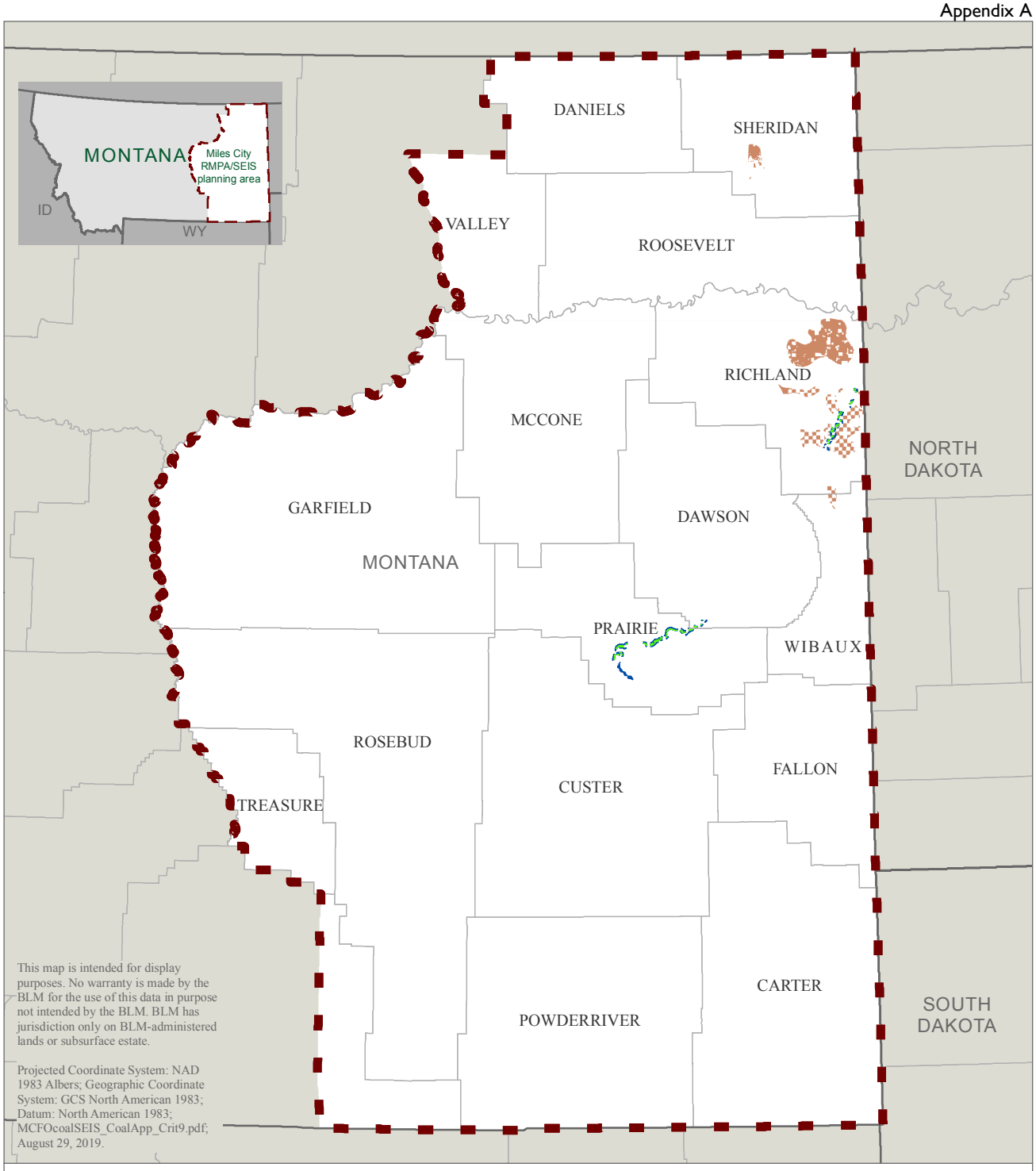
Figure A-7
Screen 2 Criterion 7 (With Exception)—Historic Lands and Sites

Historic lands and sites

1 inch = 39.3 miles

0 5 10 20 30 Miles



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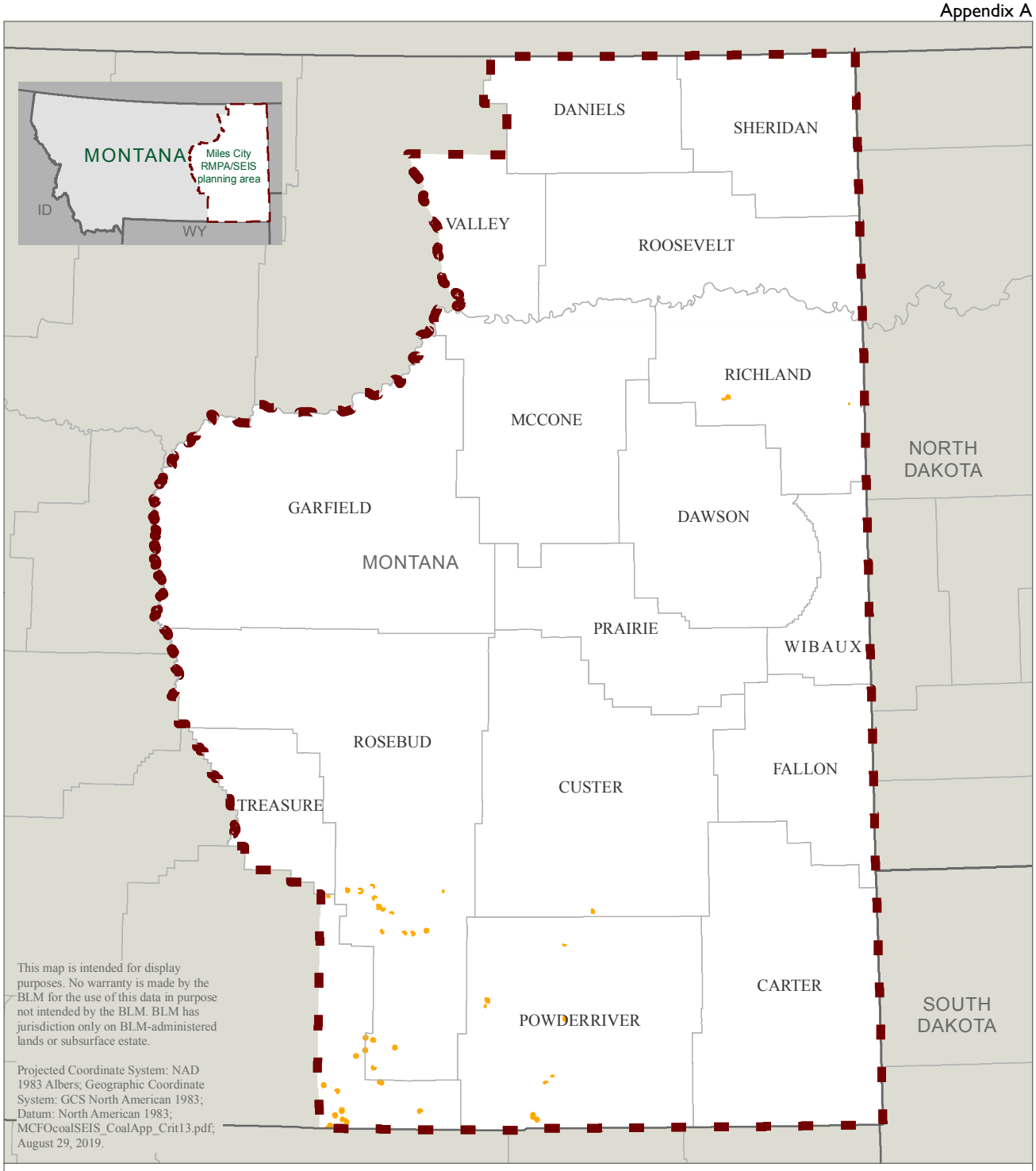
1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-8

Screen 2 Criterion 9 (With Exception)—Federally Designated Critical Essential or Proposed Habitat for Threatened and Endangered Species

Least tern
Pallid sturgeon
Whooping crane



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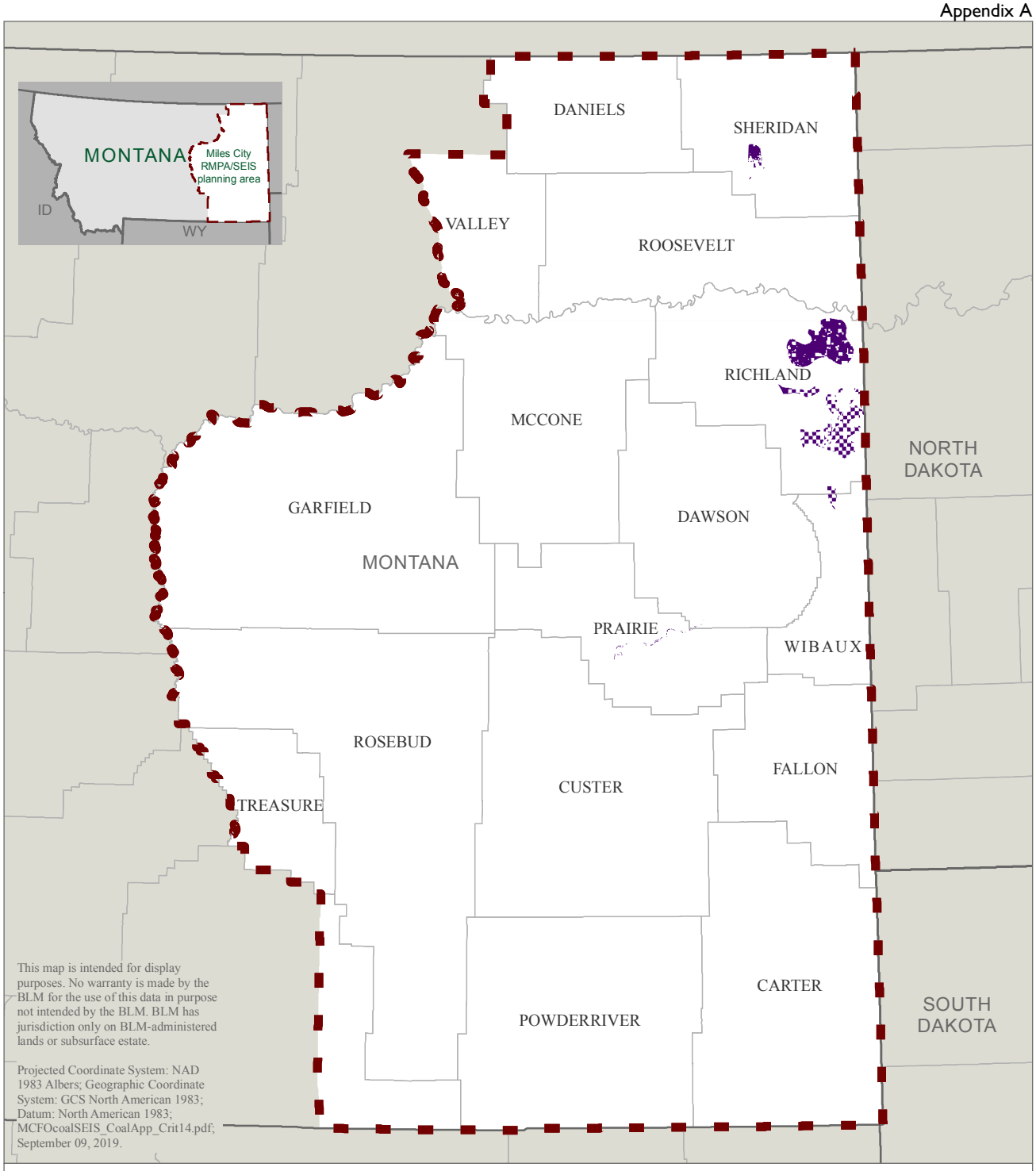
1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-9

Screen 2 Criterion 13 (With Exception)—Falcon Nesting Sites

Prairie falcon and merlin nesting site



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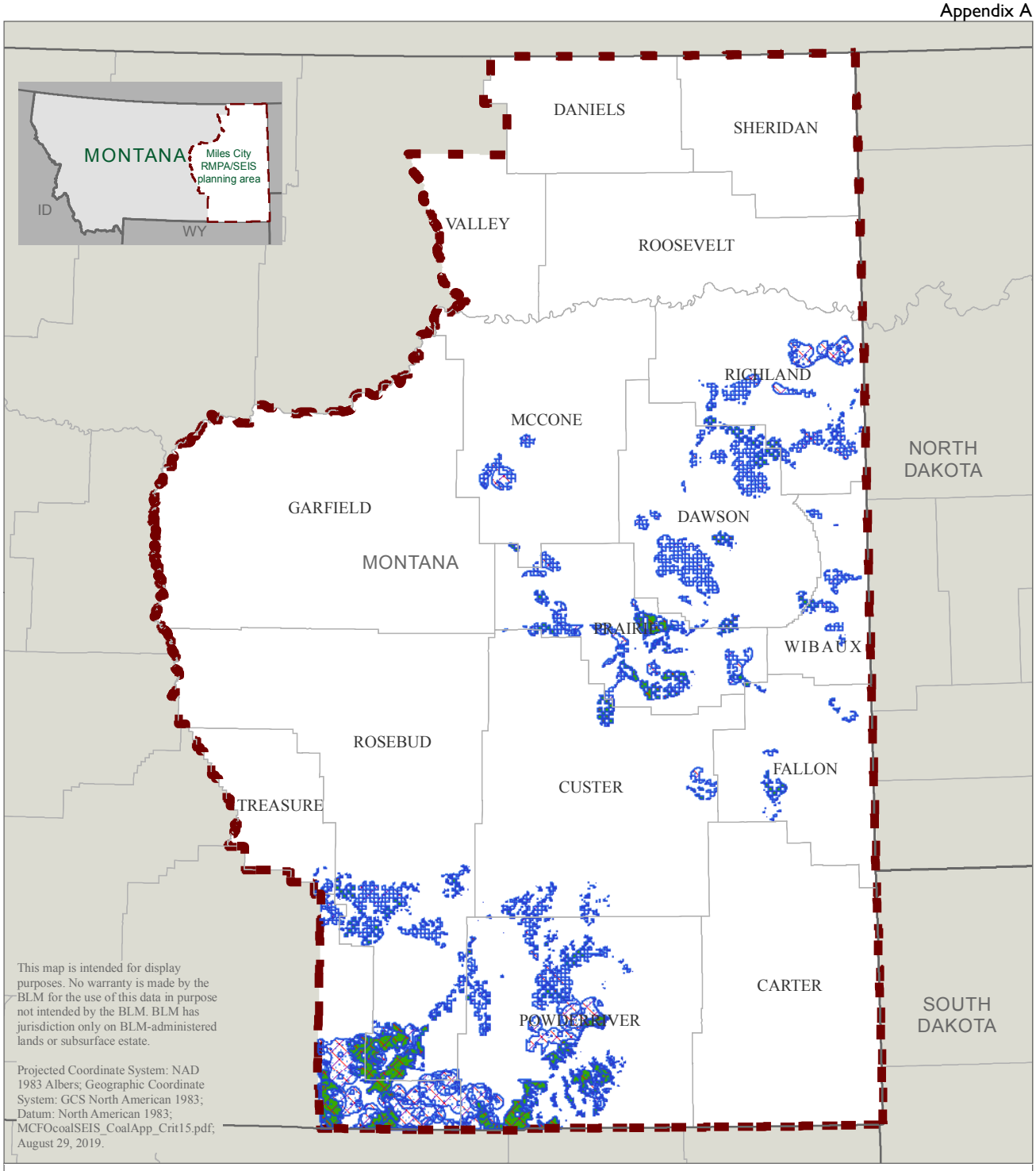
1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-10

Screen 2 Criterion 14 (With Exception)—Migratory Birds of High Federal Interest

Habitat for migratory birds of high federal interest



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MILES CITY FIELD OFFICE

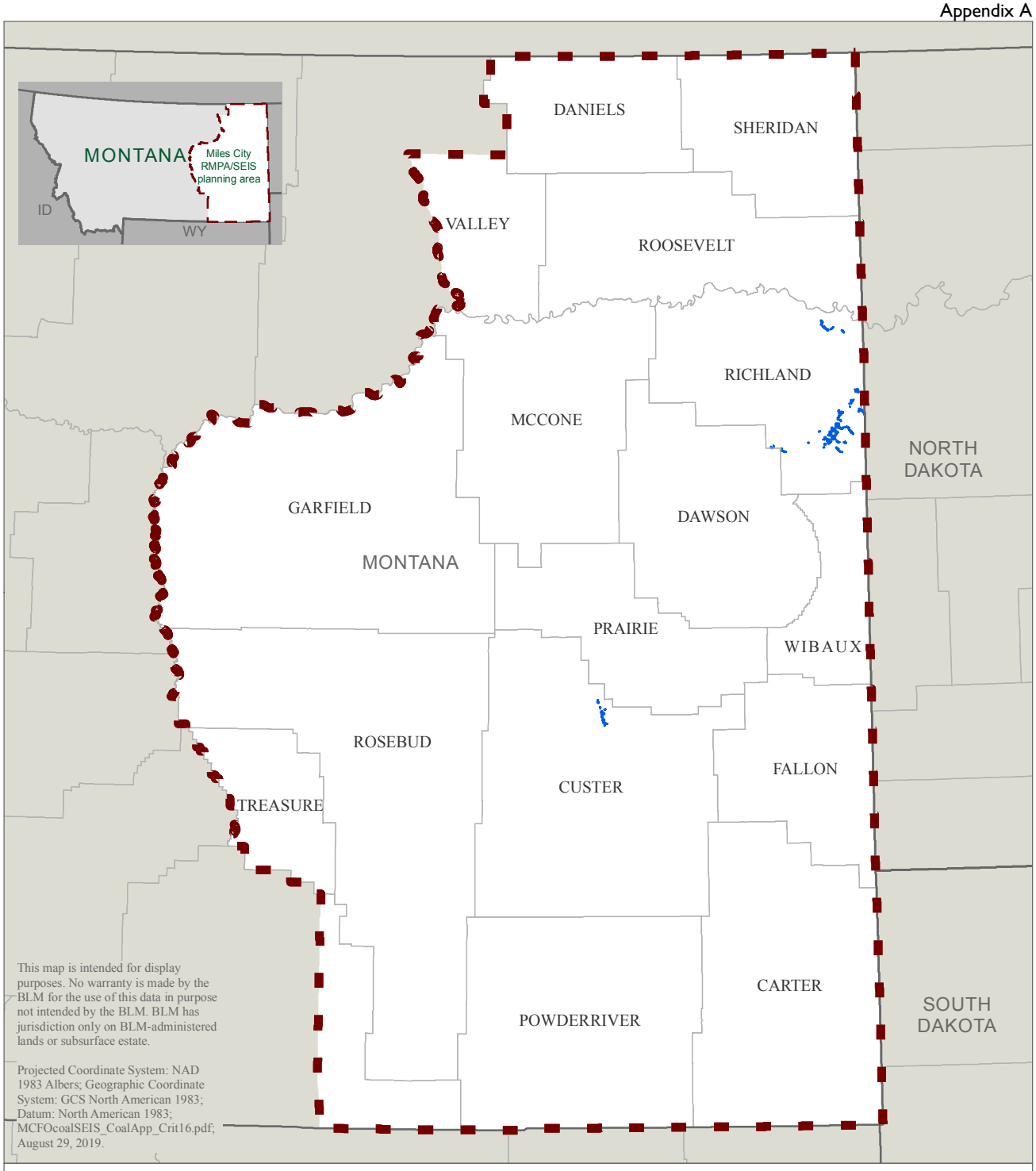
1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-11

Screen 2 Criterion 15 (With Exception)— Habitat for Species of High Interest to the State

- Sharp-tailed grouse leks
- Greater sage-grouse leks
- Greater sage-grouse priority habitat management area
- High priority fish species habitat
- Big game crucial winter range



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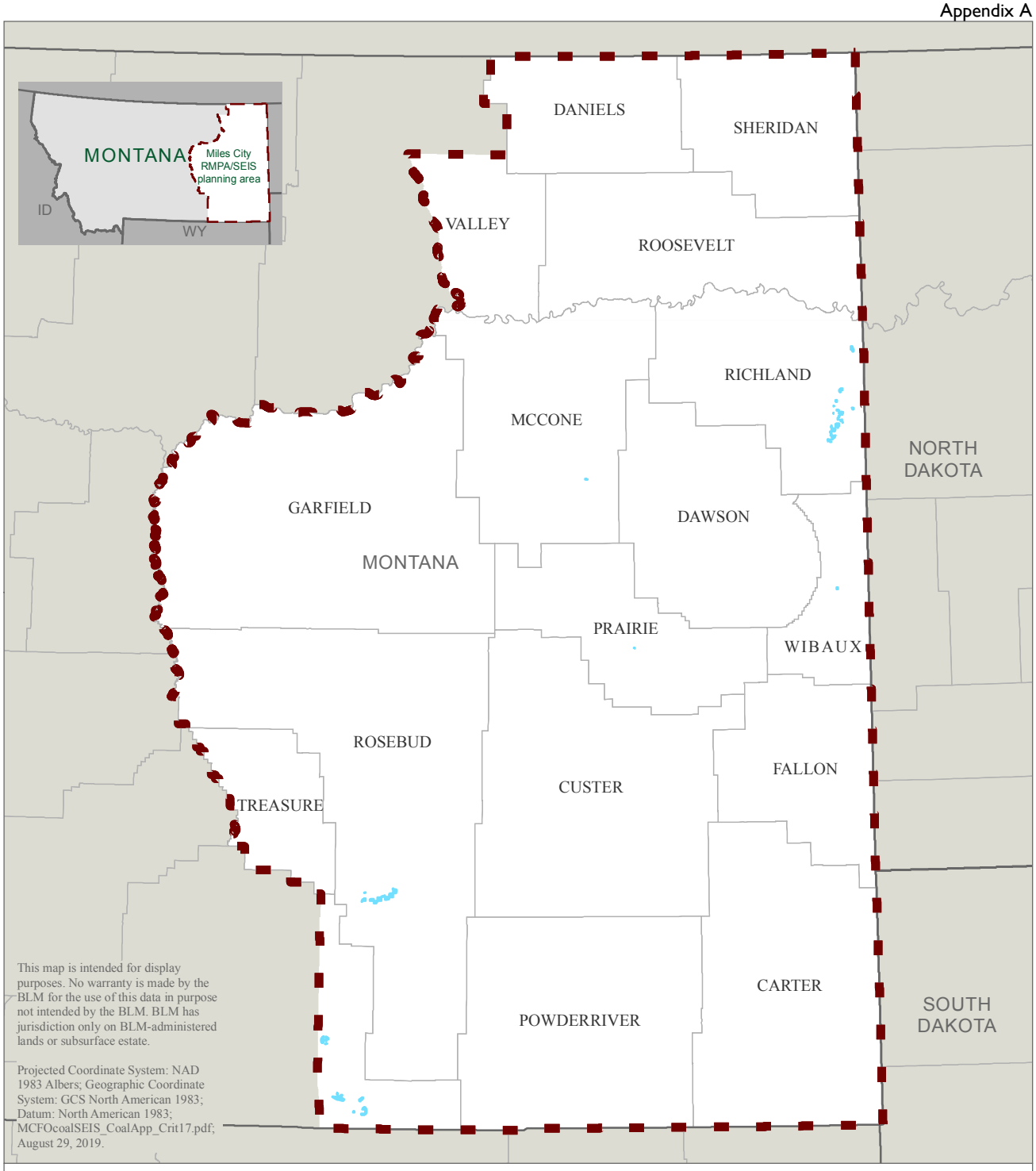
1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-12

Screen 2 Criterion 16 (Without Exception)—100-Year Floodplain

Floodplain



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MILES CITY FIELD OFFICE

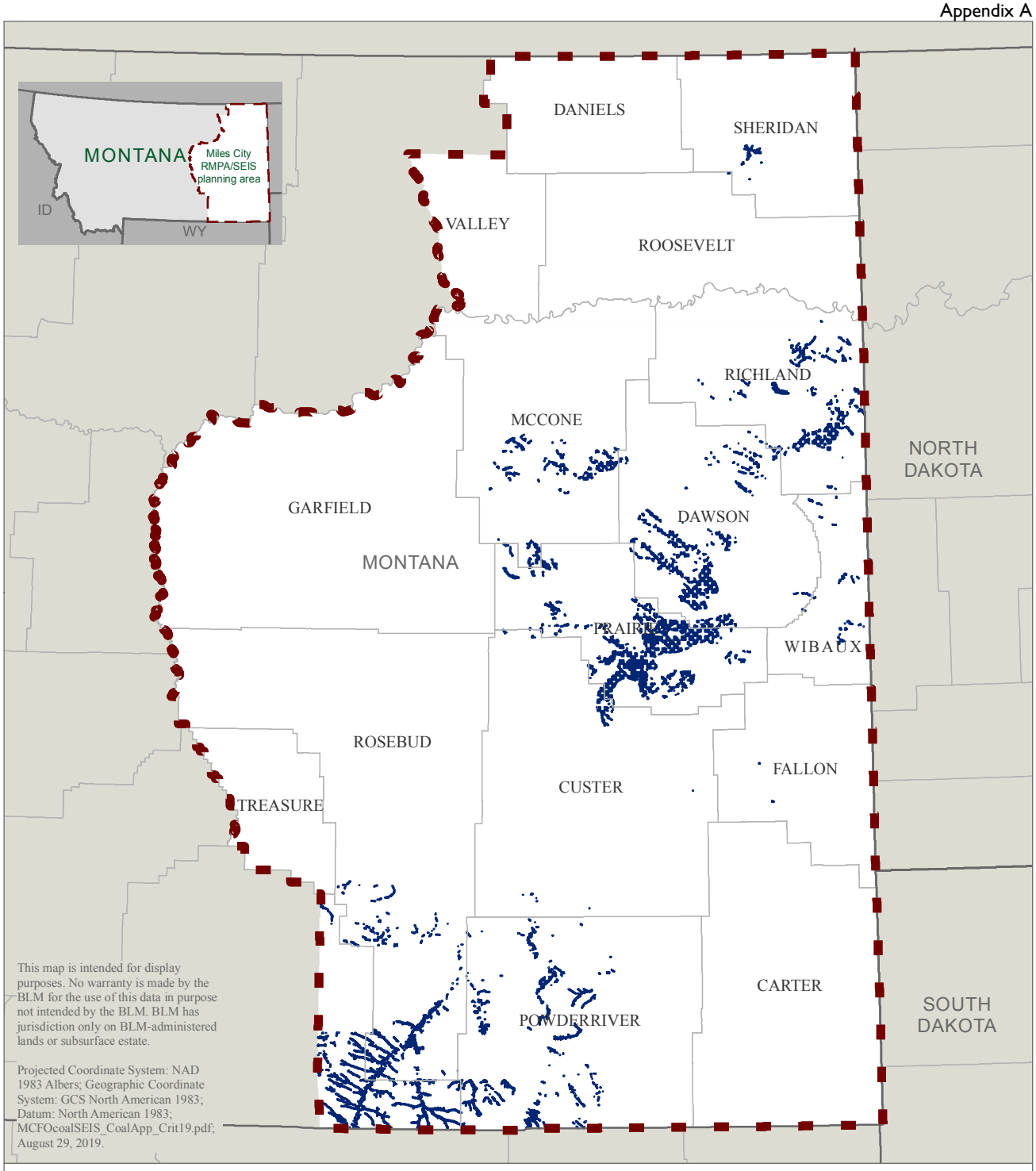
1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-13

Screen 2 Criterion 17 (With Exception)—Municipal Watersheds

Municipal watershed



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MILES CITY FIELD OFFICE

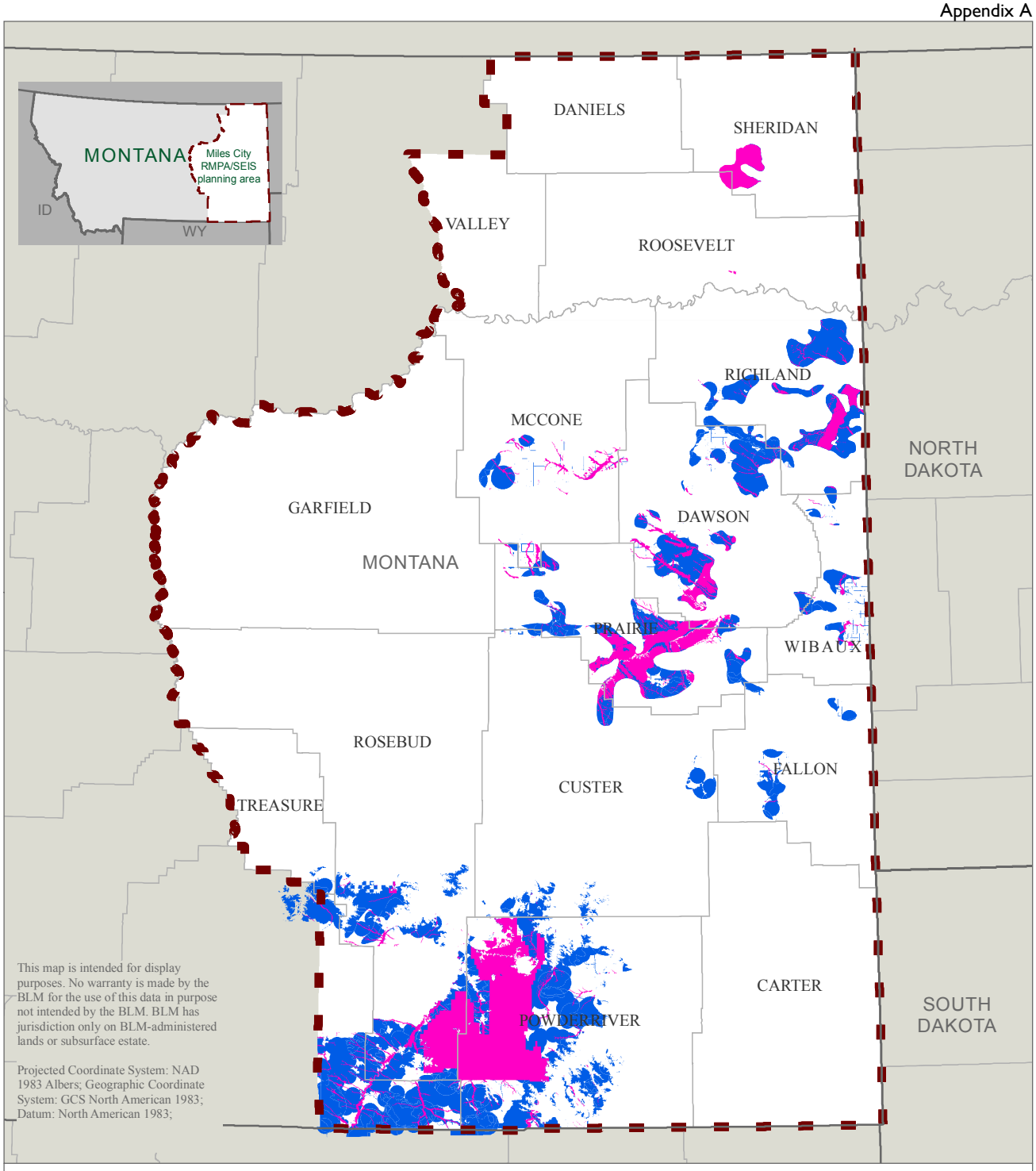
Figure A-14

Screen 2 Criterion 19 (Without Exception)—Alluvial Valley Floors

Alluvial valley floor

1 inch = 39.3 miles

0 5 10 20 30 Miles



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1 inch = 39.3 miles

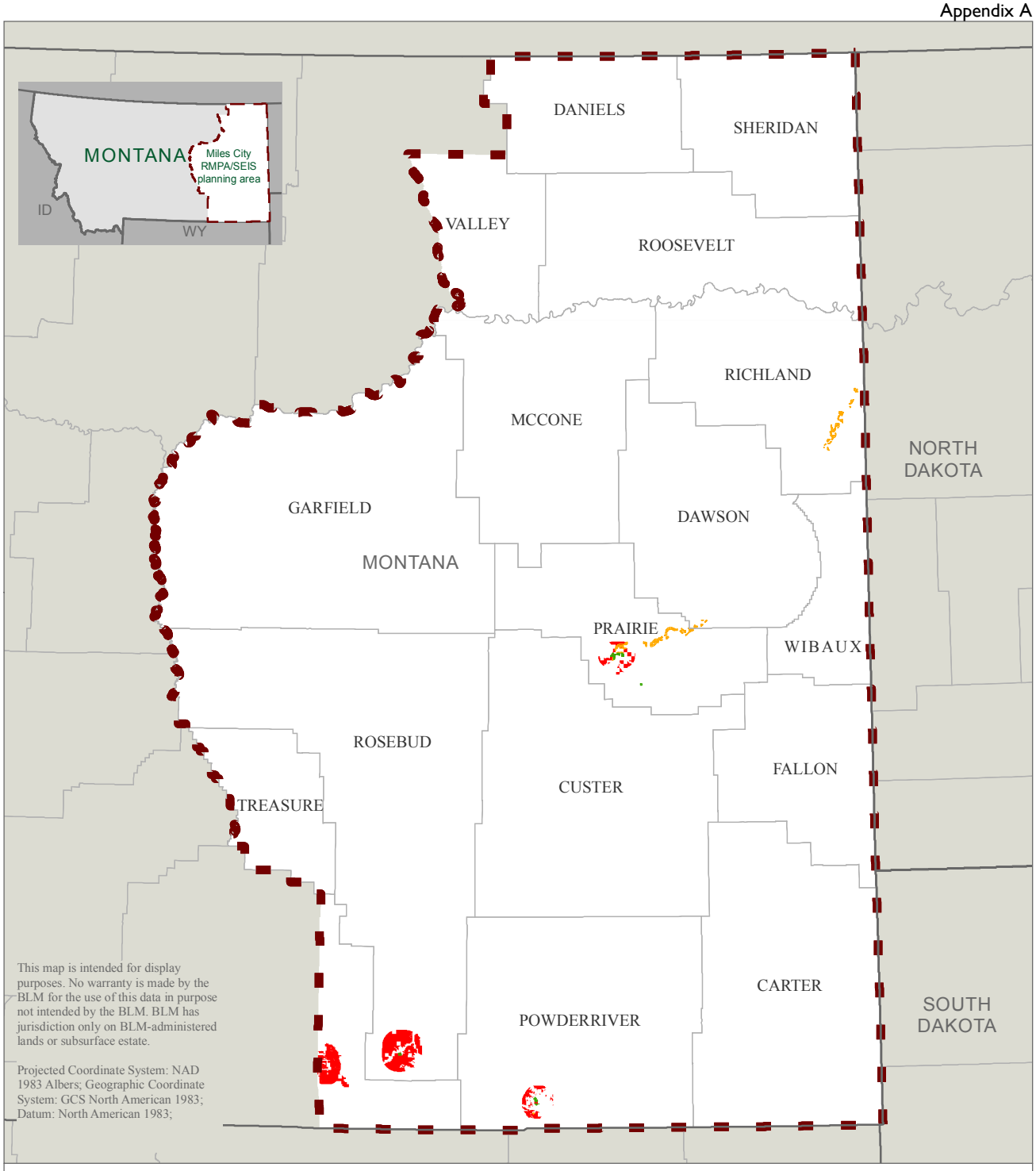
0 5 10 20 30 Miles

Figure A-15

Screen 2 (Unsuitable for all or Certain Stipulated Methods of Coal Mining)

Unsuitable without exception

Unsuitable with exception



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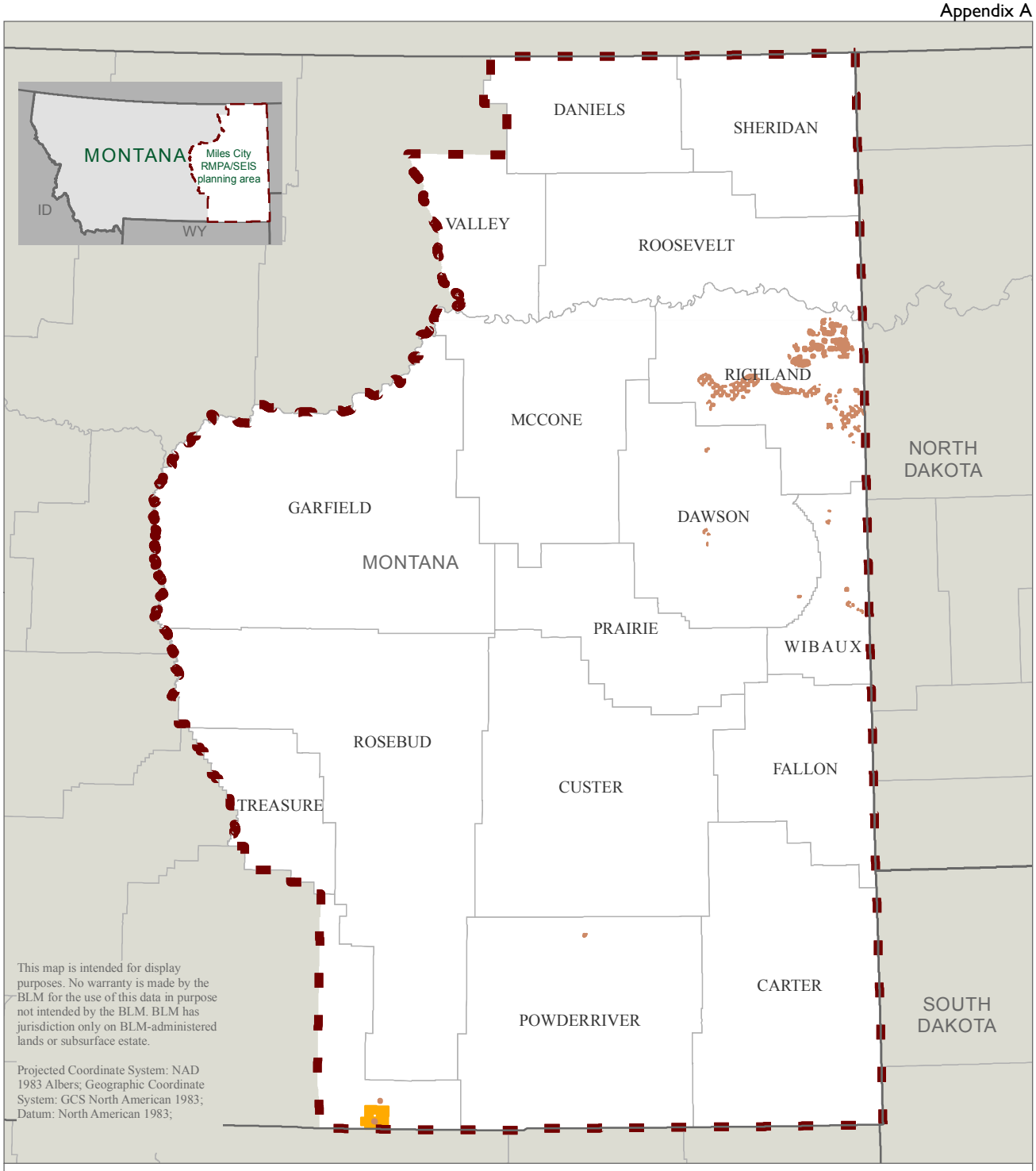
1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-16

Screen 3 Multiple-Use Decision—Cultural Viewshed, Recreation Areas, and ACECs (Alternatives B and C)

- Area of critical environmental concern
- Cultural viewshed
- Recreation area



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1 inch = 39.3 miles

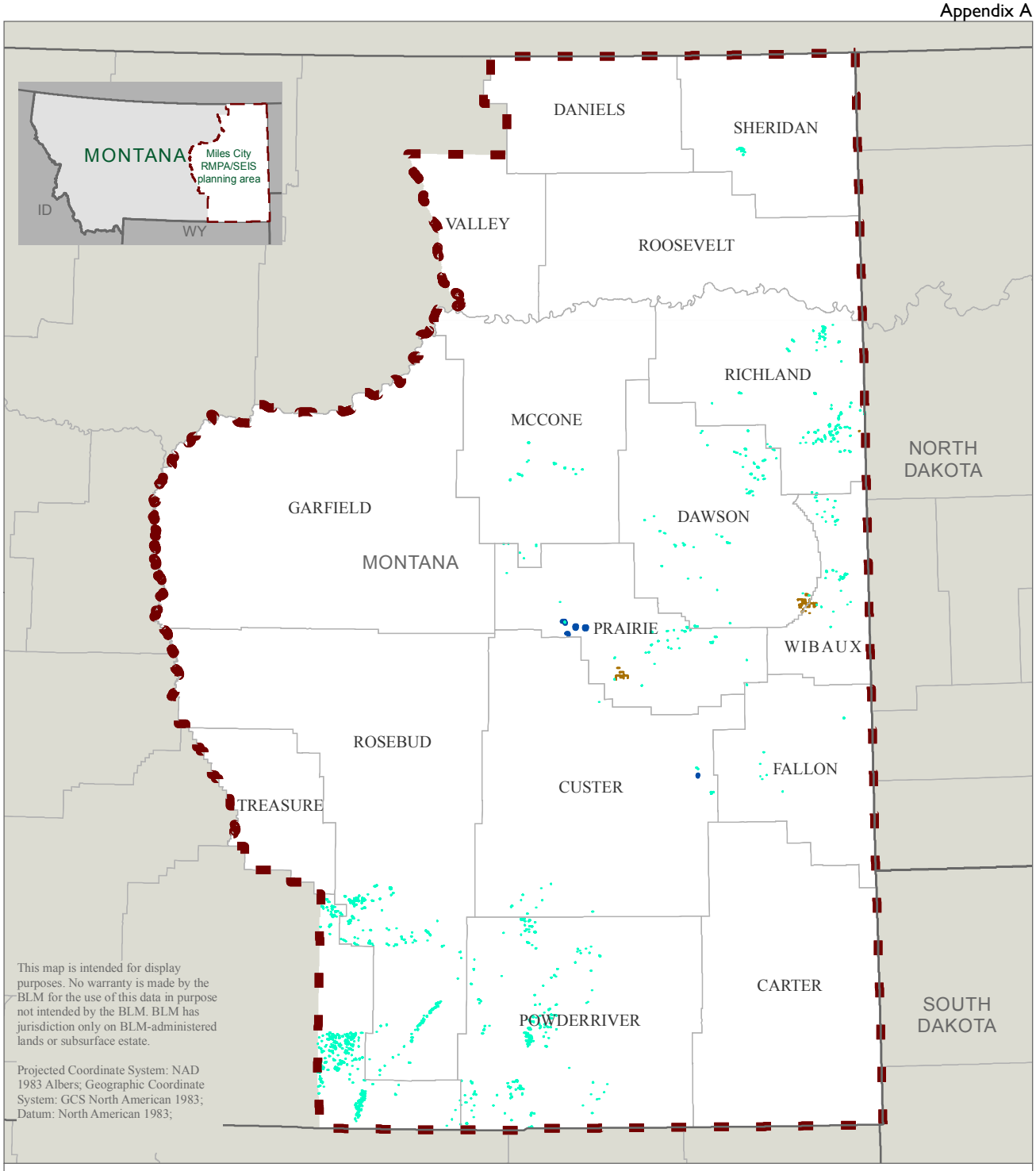
0 5 10 20 30 Miles

Figure A-17

Screen 3 Multiple-Use Decision—Oil and Gas (Alternatives B and C)

Active oil and gas well

Active oil and gas unit



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1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-18

Screen 3 Multiple-Use Decision—Biological Resources (Alternatives B and C)

- Conservation easement
- Fishing reservoirs
- Perennial, riparian, and wetland areas

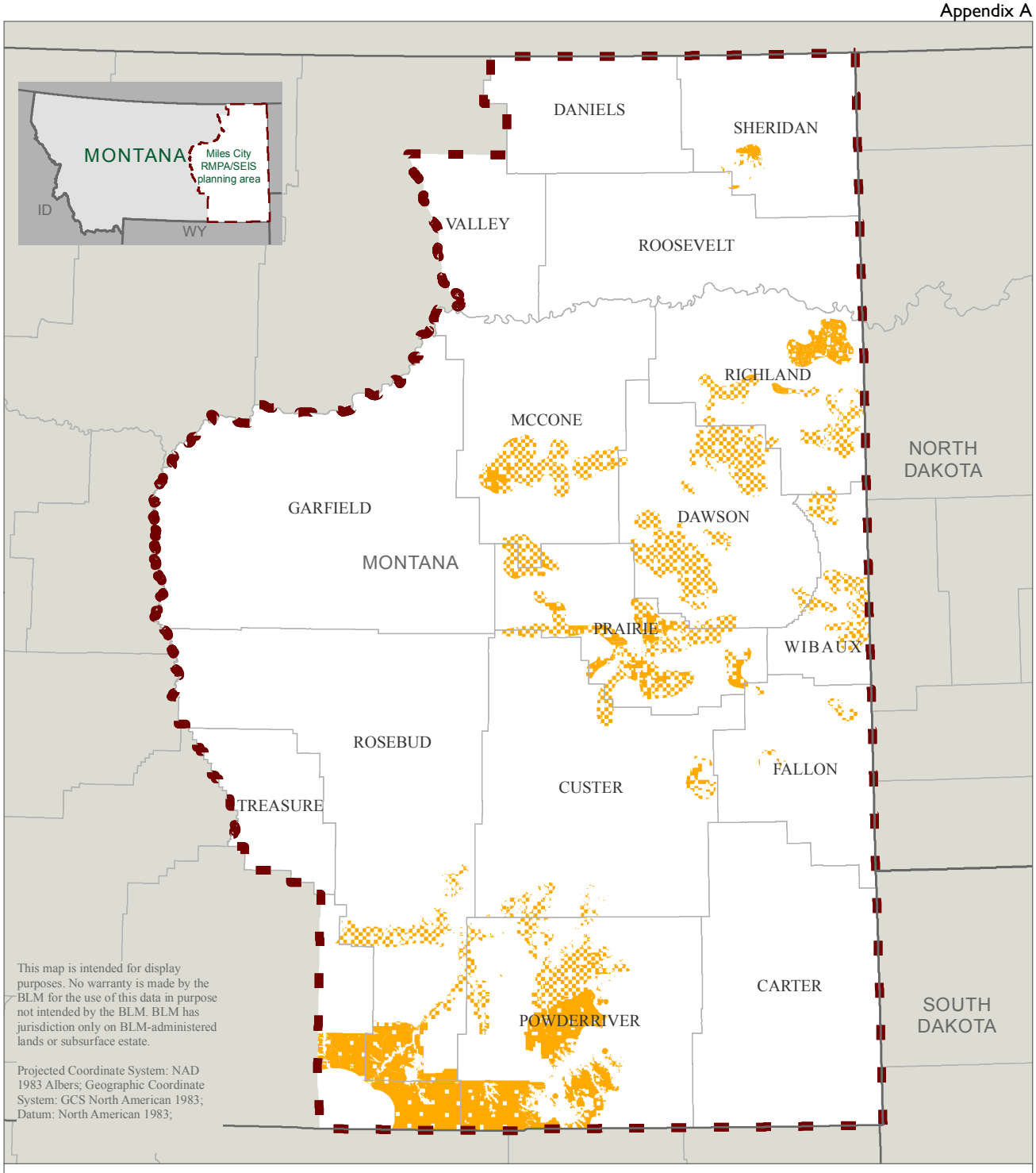

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Figure A-19

Screen 3 Multiple-Use Decision—Air and Climate (Alternative C)

Air and climate

1 inch = 39.3 miles

0 5 10 20 30 Miles

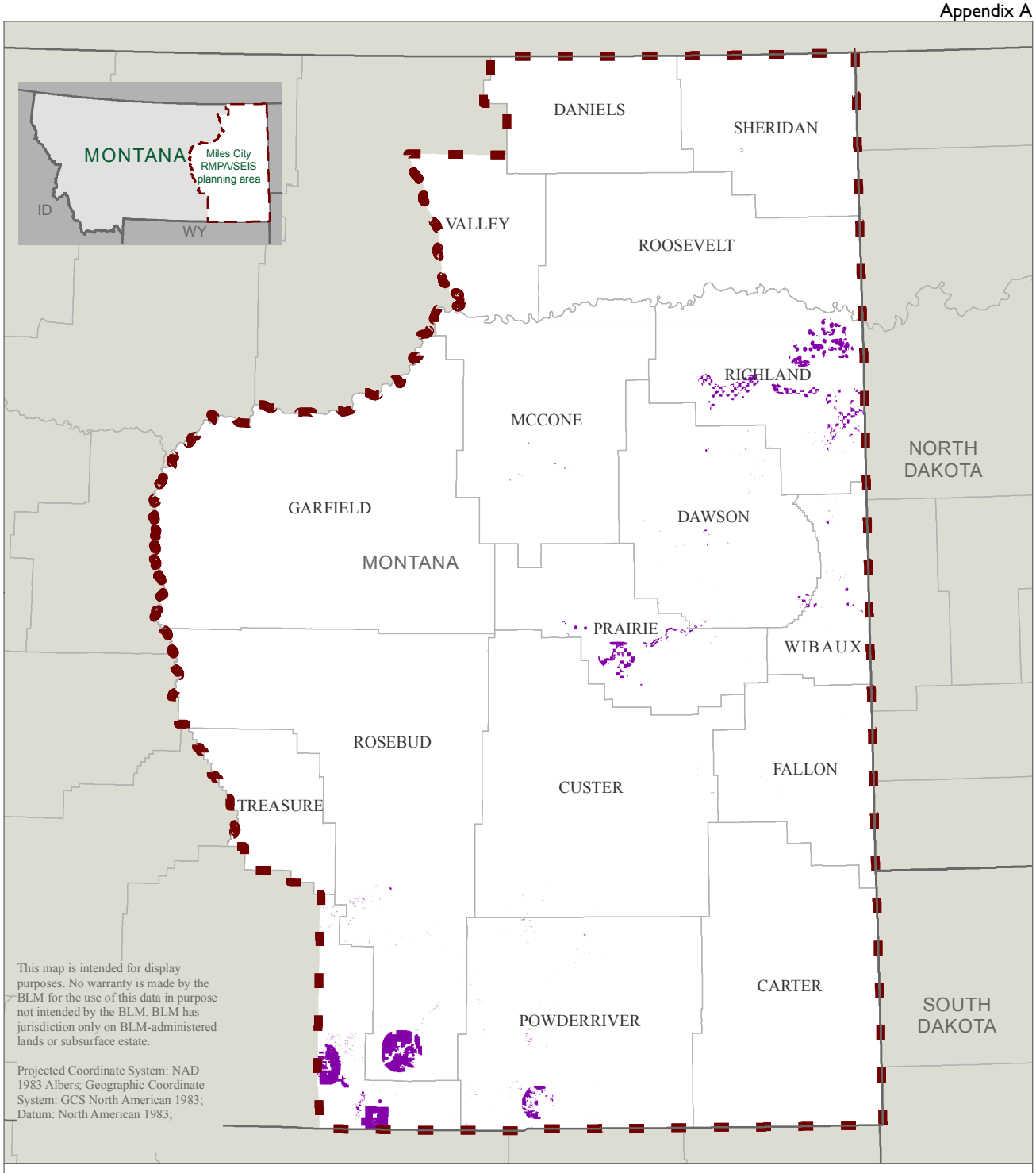

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Figure A-20
Alternative B Screen 3 (Multiple-Use)

Unavailable for leasing

1 inch = 39.3 miles

0 5 10 20 30 Miles

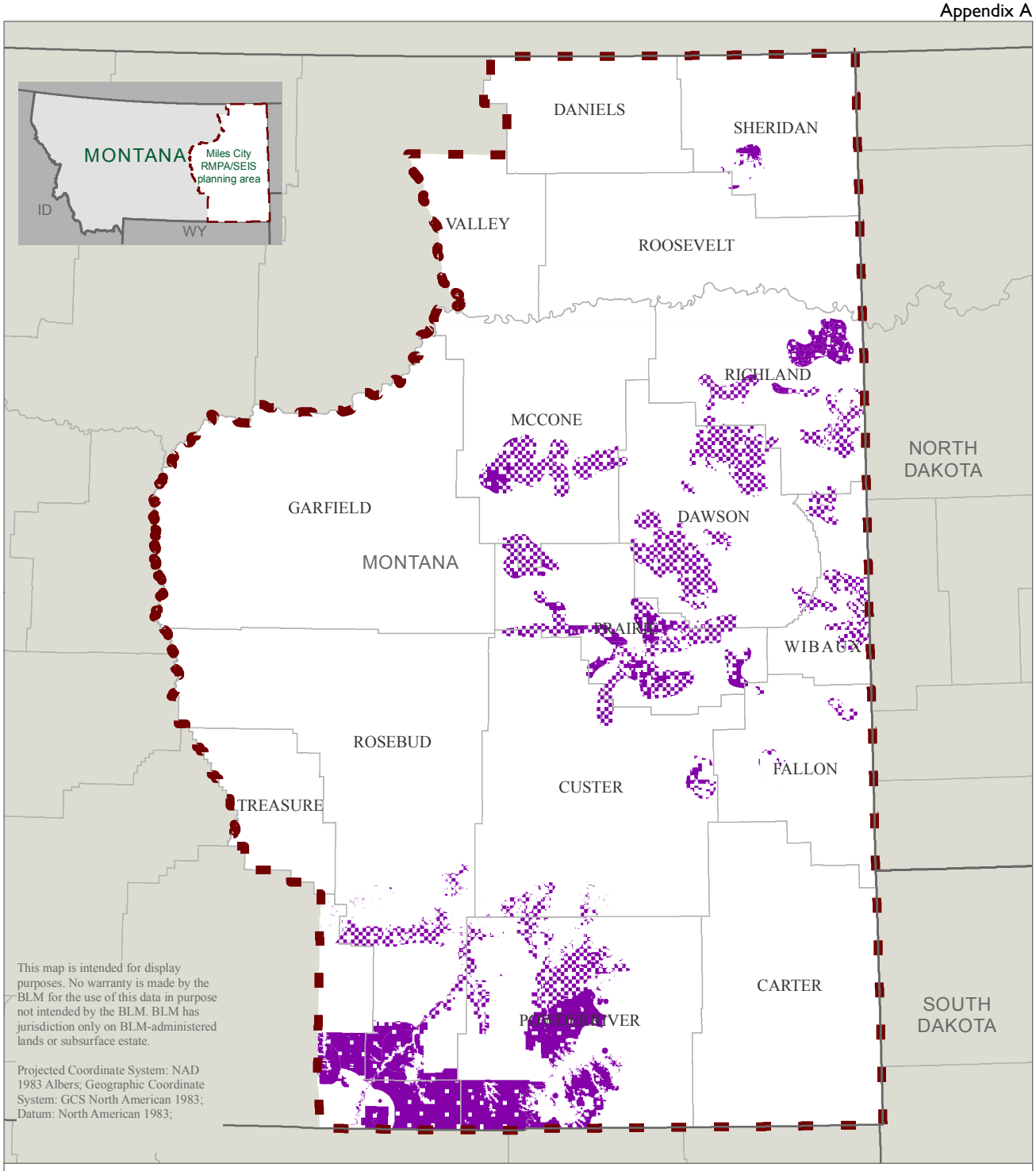

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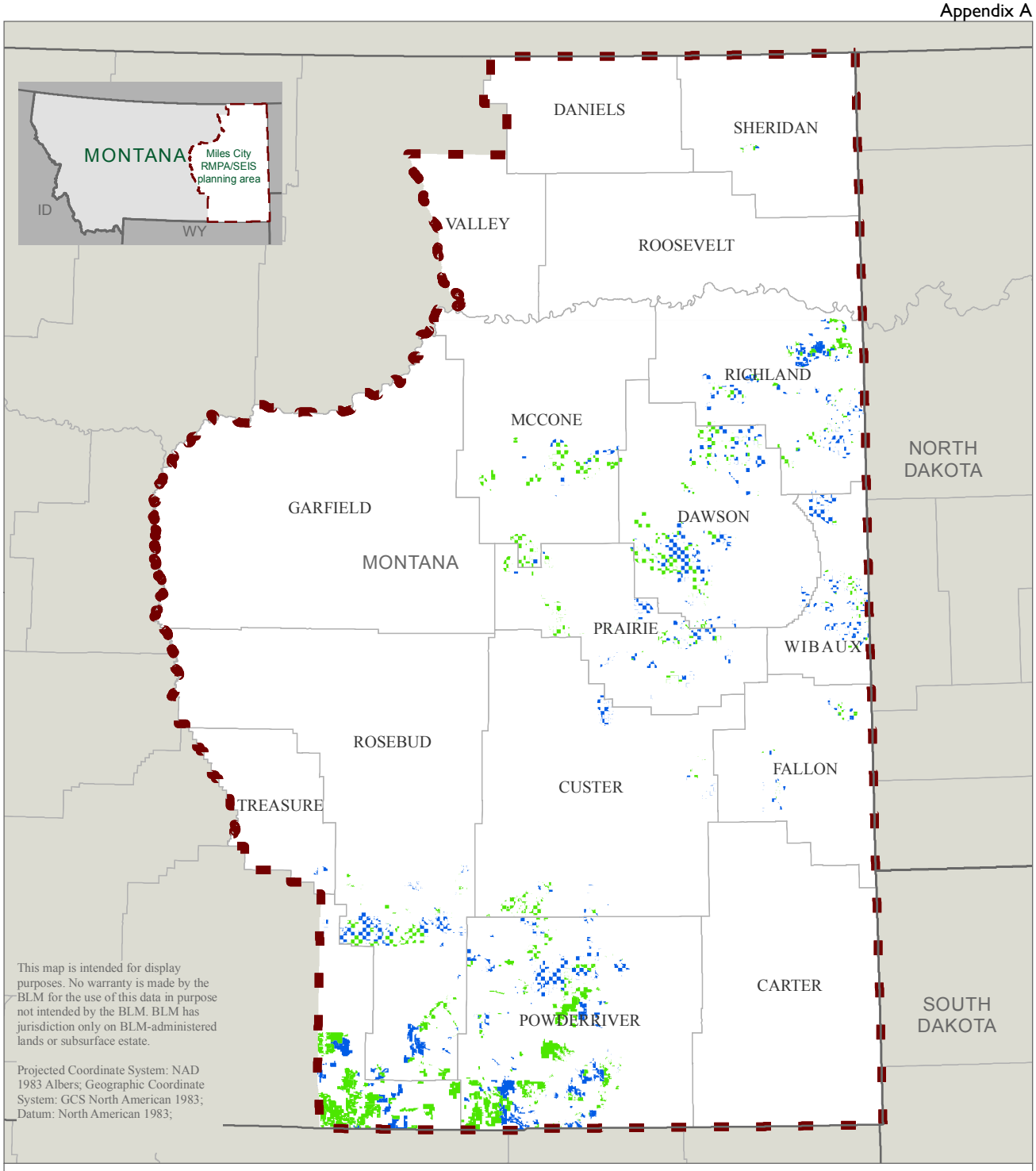
Figure A-21

Alternative C Screen 3 (Multiple-Use)

Unavailable for leasing

1 inch = 39.3 miles

0 5 10 20 30 Miles



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1 inch = 39.3 miles

0 5 10 20 30 Miles

Figure A-22

Screen 4 Consultation with Qualified Surface Owners

In favor (acceptable for further consideration for coal leasing)

Not in favor (unacceptable for further consideration for coal leasing)

Attachment 2

Sample Private Landowner Letter

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Eastern Montana-Dakotas District Office
111 Garryowen Road
Miles City, Montana 59301-7000
www.blm.gov/montana-dakotas

In Reply Refer To:
3420 (MTC0200)

January 30, 2019

FREE COPY

RE: Surface Owner Consultation Coal Screen – Amendment to the Approved Resource Management Plan for the Miles City Field Office, Montana, and Supplemental Environmental Impact Statement

Dear Surface Owner:

On November 28, 2018, the Bureau of Land Management (BLM) published a Notice of Intent (NOI) for a potential amendment to the Approved Resource Management Plan (RMP) for the Miles City Field Office and to prepare an associated Supplemental Environmental Impact Statement (SEIS). This potential amendment and associated SEIS is in response to a United States Montana District Court opinion and order (Western Organization of Resource Councils, et al vs BLM; CV 16-21-GF-BMM; 3/23/2018 and 7/31/2018).

In response to the order, the BLM is re-evaluating the four coal screens in accordance with 43 CFR 3420.1-4(e). The coal screens include: identification of coal development potential, 20 unsuitability criteria, multiple use conflicts, and surface owner consultation. The BLM has identified your private lands, which overlie federal coal deposits, as lands determined to have potential for coal development. The BLM has identified the legal land descriptions of these lands on Enclosure 1 for your review.

In accordance with 43 CFR 3420.1-4(e)(4)(i), BLM requests you notify the Miles City Field Office in writing by **March 4, 2019** on the following information:

1. If you are a qualified surface owner in accordance with 43 CFR 3400.0-5(gg) for the lands identified on Enclosure 1.
2. Your preference for or against mining by other than underground mining techniques on the lands identified on Enclosure 1.
3. Any additional information on the lands identified on Enclosure 1.

To facilitate this request, the BLM has enclosed a template document, Enclosure 1, with the appropriate information being requested. Feel free to use Enclosure 1 to notify the Miles City Field Office on the points listed above, and return it by using the enclosed envelope by **March 4, 2019**.

Any views provided through this request may be used in the completion of the SEIS and may be available for public review. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold, from public view, your personal identifying information, we

cannot guarantee that we will be able to do so. All submissions from organizations, from businesses, and from individuals identifying themselves as representatives of organizations or businesses, will be available for public review.

Because this is a planning document, lands considered under this SEIS would be analyzed to determine if they are acceptable for further considerations for coal leasing or unacceptable for further considerations for coal leasing. Leasing decisions would be considered under separate NEPA reviews when an application for leasing is submitted to the BLM. Therefore, the BLM would not be making leasing decisions at this time.

After review of the surface owner consultation responses, the SEIS will be prepared. BLM plans to have the SEIS available for public comment in spring 2019. The SEIS will be posted on the BLM e-Planning website, https:eplanning.blm.gov; where the project webpage can be found by conducting a land use plan text search for project DOI-BLM-MT-C020-2019-0004-RMP-EIS. Updated information, and associated documents, are also posted on the e-Planning project website.

We look forward to hearing from you on this project. If you have any questions, please contact Irma Nansel, Planning and Environmental Coordinator, at (406) 233-3653.

Sincerely,

Diane M. Friez

Diane M. Friez
District Manager

Enclosure 1 - Template Document for Surface Owner Consultation

MTC0200:INansel:Hudson:1/30/19:Inansel_SurfaceOwnerConsultation_SEIS_Ltr_FY19

Enclosure 1.

Please returned to the Miles City Field Office by March 4, 2019.

Please Check One:

___ I am authorized to express my views as a qualified surface owner in accordance with 43 CFR 3400.0-5(gg), having met the following requirements for at least the past three years (or less if I have given written consent); I hold legal or equitable title of this land surface. I have my principal residence on this land, or I personally farm or ranch on this land, or I receive a significant portion of my income from farm or ranch operations on this land. I have met the requirements since _____.

___ I do not meet the requirements for a qualified surface owner in accordance with 43 CFR 3400.0-5(gg). Please explain below.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold, from public view, your personal identifying information, we cannot guarantee that we will be able to do so. All submissions from organizations, from businesses, and from individuals identifying themselves as representatives of organizations or businesses, will be available for public review.

Please identify your view(s) on leasing as listed below by aliquot or group of land description also listed below. Multiple views can be identified by aliquot or group land description(s). Provide additional information on the reserve side.

1. I am in favor of leasing of federal coal on these lands.
2. I am against leasing of federal coal on these lands.
3. I am undecided whether I favor or oppose federal coal leasing on these lands.
4. I have already given written consent for surface mining of federal coal on these lands.

Appendix B

Air Resources Technical Support Report

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Appendix B.
Air Resources Technical Support Report

This report provides additional details on the greenhouse gas (GHG) emissions estimates completed for the air resources analysis included in **Chapter 3** of the Supplemental Environmental Impact Statement (SEIS)/Resource Management Plan Amendment (RMPA) for the MCFO. **Tables 3-3** through **3-6** in **Section 3.3** of the SEIS/RMPA summarize total GHG emissions in units of carbon dioxide equivalents (CO_2e) from federal coal, federal oil, federal natural gas, and federal coalbed natural gas, respectively.

This appendix details GHG emissions by pollutant. **Tables B-1** through **B-4** show the GHG emissions from federal coal, federal oil, federal natural gas, and federal coalbed natural gas, respectively, for carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), which are the primary compounds that contribute to GHG emissions in the Miles City Field Office. **Table B-1** presents the CO_2, CH_4, and N_2O emissions from federal coal production, transportation, downstream combustion of federal coal, and compound totals. **Tables B-2** through **B-4** present the CO_2, CH_4, and N_2O emissions from oil and gas production and downstream combustion of federal oil and gas. Oil and gas transportation emissions are assessed qualitatively in **Section 3.3** of the SEIS/RMPA.

Section 3.3 discusses the emission factors and methods used in the calculations. Below is more information on the calculation method and emission factors used. The Excel spreadsheets mentioned are available in the administrative record for the SEIS/RMPA.

The GHG emissions are the same under the No Action Alternative (Alternative A) and the action alternatives (Alternatives B and C). This is because the same reasonably foreseeable development (RFD) was used in all three alternatives.

B.1 COAL

The annual coal production rates and GHG emissions from federal and nonfederal coal production, transportation, and downstream combustion were derived as described below.

B.1.1 Coal Production Rate

The Miles City Field Office (MCFO) forecast the annual coal production rates for an RFD scenario. It did this in anticipation of federal and nonfederal coal resource development in the

MCFO from 2019 to 2038. It was based on development trends and expected changes to them. The development of the RFD coal production rates is described in detail in Appendix C.

B.1.2 Coal Production Emissions

The MCFO used federal and nonfederal emissions estimates on a ton per ton of coal production basis, from the 2015 Proposed RMP/Final EIS Air Resources Technical Support Document for CO_2, CH_4 and N_2O, along with the 2019–2038 RFD. The purpose was to estimate production equipment emissions of CO_2, CH_4, and N_2O for each year during the 2019–2038 planning period. Emissions of CH_4 from coal off gassing were calculated using the EPA's State Inventory and Projection Tool (https://www.epa.gov/statelocalenergy/state-inventory-and-projection-tool) applied to Montana and the annual RFD coal production rates for 2019–2038. The EPA tool is at that website under Coal Module.EPA State Inventory Projection Tool.xlsm, and the calculation of production emissions is on the website in the Excel file MCFO_Coal_O&G.xlsx under the Coal_upstream tab.

B.1.3 Coal Transportation Emissions

Emissions of CO_2, CH_4, and N_2O from transportation of federal and nonfederal coal by rail using diesel locomotives were estimated based on the following:

- Annual tons of coal produced and the average train haul distance of 1,500 miles
- EPA emission factors for diesel locomotives
- Burlington Northern Santa Fe Railway fuel efficiency factors
- The typical ratio of weight of an unloaded train car to a loaded car (see SEIS Section 3.1.2 and references therein)

The method for calculating the emissions is discussed in detail in Section 3.1.2, and the calculations are shown in the file MCFO_transportation.xlsx.

B.1.4 Coal Downstream Combustion Emissions

Downstream emissions from federal and nonfederal coal combustion were estimated using emissions factors for CO_2, CH_4, and N_2O for stationary combustion of sub-bituminous coal from the EPA Emission Factors for Greenhouse Gas Inventories, March 2018 (EPA 2018b). All of the coal produced was conservatively assumed to be combusted. The emission factors used are 1,676 kilograms per short ton, 190 kilograms per short ton, and 28 kilograms per short ton, respectively. The emission factor for sub-bituminous coal was used because more than 99 percent of coal produced in the planning area is sub-bituminous. Non-sub-bituminous coal outside the planning area was not considered because the US District Court Order of March 2018 stated downstream combustion must be considered for the resource open to development under the RMP. The calculation of downstream combustion emissions is shown in the Excel file MCFO_Coal_O&G.xlsx under the Coal_downstream tab.

B.2 OIL

The sources of information and calculation methods for federal and nonfederal oil combustion are described below.

B.2.1 Oil Production Rate

Oil production is calculated using RMP year 20 producing well count and average per well production rate in the 2015 Proposed RMP/Final EIS. The production rate is assumed to be constant from 2019 to 2038, using the 2015 RMP year 20 count for number of producing wells and absent other detailed information, as follows:

- Oil production rate = 20 barrels per well per day
- Federal—Year 20 producing well count = 417, hence oil production = 3.0 million barrels oil per year (MMBO/yr)
- Non-federal—Year 20 producing well count = 2,827, hence oil production = 20.6 MMBO/yr

B.2.2 Oil Production Emissions

The emissions are based on the 2015 Proposed RMP/Final EIS. Production emissions calculations are available for construction, operation, maintenance, and reclamation from the 2015 RMP in the MCFO_oil_Alt_E.xlsx spreadsheet, under the Input-Output tab. Emissions can be read from grid columns I, J, and K under this tab. The method for calculating production emissions is discussed in the 2015 RMP/Final EIS.

Following the production rate, annual production emissions are constant from 2019 to 2038. The annual federal emissions are 60,572 tons CO_2, 296 tons CH_4, 0.57 tons N_2O; the annual non-federal emissions are 387,996 tons CO_2, 1,994 tons CH_4, 2.82 tons N_2O

The emissions rate calculations are shown under the Oil_upstream tab in MCFO_Coal_O&G.xlsx. The annual GHG emission rates in short tons per year are converted to metric tons per year.

B.2.3 Oil Downstream Combustion Emissions

Combustion emissions calculations for federal and non-federal oil are shown under the O&G_downstream tab in MCFO_Coal_O&G.xlsx. They are based on the annual oil production rate and the following emission factors for distillate fuel oil no. 2: 10.21 kilograms of CO_2/gallon, 0.41 grams of CH_4/gallon, and 0.08 grams of N_2O/gallon. All oil produced was conservatively assumed to be combusted. These emission factors were used because they represent a typical use of oil in the US for residential heating (see the EPA emission factors table in emission-factors_mar_2018_0.pdf at https://www.epa.gov/climateleadership/center-corporate-climate-leadership-ghg-emission-factors-hub).

B.3 Natural Gas

The sources of information and calculation methods for federal and nonfederal conventional and coalbed natural gas are described below.

B.3.1 Conventional Natural Gas Production Rate

Conventional natural gas production is calculated using RMP year 20 producing well count and average per well production rate in the 2015 Proposed RMP/Final EIS. The method for calculating production emissions is discussed in the 2015 RMP/Final EIS. The production rate is

estimated to be the same from 2019 to 2038, assuming the number of producing wells is constant at the 2015 RMP year 20 count and absent other detailed information, as follows:

- Conventional natural gas production rate = 40 thousand cubic feet per well per day
- Federal—Year 20 producing well count = 350; conventional natural gas production rate = 5.1 billion cubic feet per year (BCF/yr)
- Non-federal—Year 20 producing well count = 2,338; conventional natural gas production rate = 34.1 BFC/yr

B.3.2 Coalbed Natural Gas Production Rate

Coalbed natural gas production is calculated using RMP year 20 producing well count and average per well production rate in the 2015 Proposed RMP/Final EIS. The method for calculating production emissions is discussed in the 2015 RMP/Final EIS. The production rate is estimated to be the same from 2019 to 2038, assuming the number of producing wells is constant at the 2015 RMP year 20 count and absent other detailed information, as follows:

- Coalbed natural gas production rate = 45 thousand cubic feet per well per day
- Federal—Year 20 producing well count = 486; coalbed natural gas production rate = 8.0 BCF/yr
- Non-federal—Year 20 producing well count = 660; coalbed natural gas production rate = 10.8 BCF/yr

B.3.3 Conventional Natural Gas Production Emissions

The emissions are based on the 2015 Proposed RMP/Final EIS. Production emissions calculation are available for construction, operation, maintenance and reclamation from the 2015 RMP in the MCFO_NG_Alt_E.xlsx spreadsheet under the Input-Output tab. Emissions can be read from grid columns I, J, and K. As in the case of the production rate, production emissions are set to be constant from 2019 to 2038, as follows:

- Federal emissions per year—19,118 tons CO_2, 85 tons CH_4, and 0.13 tons N_2O
- Non-federal emissions per year—118,895 tons CO_2, 562 tons CH_4, and 0.51 tons N_2O

The emissions rate calculations are shown under NG_upstream tab in the file MCFO_Coal_O&G.xlsx. (Note: The annual emissions rates in short tons per year are converted to metric tons per year.)

B.3.4 Coalbed Natural Gas Production Emissions

The emissions are based on the 2015 Proposed RMP/Final EIS. Production emissions calculations are available for construction, operation, maintenance, and reclamation from the 2015 RMP in the MCFO_NG_Alt_E.xlsx spreadsheet under the Input-Output tab. Emissions can be read from grid columns I, J, and K. As in the case of the production rate, production emissions are set to be constant from 2019 to 2038, as follows:

- Federal emissions per year—18,726 tons CO_2, 109 tons CH_4, and 0.06 tons N_2O

- Non-federal emissions per year—25,373 tons CO_2, 147 tons CH_4, and 0.11 tons N_2O

The emission rate calculations are shown under the CBNG_upstream tab in the file MCFO_Coal_O&G.xlsx. (Note: The annual emissions rates in short tons per year are converted to metric tons per year.)

B.3.5 Conventional and Coalbed Natural Gas Downstream Combustion Emissions

Combustion emissions calculations for federal and non-federal natural gas are shown under the O&G_downstream tab in the file MCFO_Coal_O&G.xlsx. The emissions were calculated from the annual gas production rate and the emissions factors for natural gas, provided below. All natural gas produced was conservatively assumed to be combusted.

The following emissions factors for natural gas (both conventional and coalbed natural gas) were used: 0.05444 kilograms CO_2 per billion cubic feet, 0.00103 grams CH_4 per standard cubic foot, and 0.0001 grams N_2O per standard cubic foot. These emissions factors were obtained from the EPA emissions factors table in emission-factors_mar_2018_0.pdf (https://www.epa.gov/climateleadership/center-corporate-climate-leadership-ghg-emission-factors-hub).

Table B-1
CO_2, CH_4, and N_2O Emissions from Federal Coal Production, Transportation, and Downstream Combustion

Year	Federal RFD Coal Production Rate (MMst)[1]	CO_2 (metric tons)[2]				CH_4 (metric tons)[2]				N_2O (metric tons)[2]			
		Prod.	Trans.	Comb.	Total	Prod.	Trans.	Comb.	Total	Prod.	Trans.	Comb.	Total
2019	18.5	31,180	181,429	30,970,469	31,183,078	16,257	16	3,511	19,784	0.31	5.21	517	522.93
2020	25.4	42,925	276,088	42,635,429	42,954,441	22,381	24	3,511	25,916	0.43	7.93	712	720.64
2021	25.3	42,631	276,088	42,343,805	42,662,524	22,228	24	3,511	25,762	0.43	7.93	707	715.77
2022	24.6	41,505	276,088	41,225,913	41,543,506	21,641	24	3,511	25,176	0.42	7.93	689	697.08
2023	23.9	40,380	276,088	40,108,021	40,424,489	21,054	24	3,511	24,589	0.40	7.93	670	678.39
2024	23.9	40,380	276,088	40,108,021	40,424,489	21,054	24	3,511	24,589	0.40	7.93	670	678.39
2025	23.9	40,380	276,088	40,108,021	40,424,489	21,054	24	3,511	24,589	0.40	7.93	670	678.39
2026	23.9	40,380	276,088	40,108,021	40,424,489	21,054	24	3,511	24,589	0.40	7.93	670	678.39
2027	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2028	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2029	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2030	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2031	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2032	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2033	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2034	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2035	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2036	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2037	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49
2038	21.6	36,465	244,535	36,219,701	36,500,701	19,013	21	3,511	22,545	0.36	7.02	605	612.49

[1] RFD=Reasonably Foreseeable Development; MMst: million short tons
[2] Prod=production; Trans=transportation; Comb=combustion

Table B-2
CO_2, CH_4, and N_2O Emissions from Federal Oil Production and Downstream Combustion

Year	Federal RFD Oil Production Rate (MMBO)[1]	CO_2 (metric tons)			CH_4 (metric tons)			N_2O (metric tons)		
		Production	Combustion	Total[2]	Production	Combustion	Total[2]	Production	Combustion	Total[2]
2019	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2020	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2021	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2022	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2023	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2024	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2025	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2026	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2027	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2028	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2029	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2030	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2031	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2032	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2033	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2034	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2035	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2036	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2037	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11
2038	3.0	54,951	1,305,371	1,360,322	268	52	321	0.57	10	11

[1] RFD=Reasonably Foreseeable Development; MMBO=million barrels of oil
[2] Totals may not sum exactly due to rounding

Table B-3
CO_2, CH_4, and N_2O Emissions from Federal Natural Gas Production and Downstream Combustion

Year	Federal RFD Natural Gas Production Rate (BCF)[1]	CO_2 (metric tons)			CH_4 (metric tons)			N_2O (metric tons)		
		Production	Combustion	Total[2]	Production	Combustion	Total[2]	Production	Combustion	Total[2]
2019	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2020	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2021	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2022	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2023	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2024	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2025	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2026	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2027	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2028	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2029	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2030	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2031	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2032	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2033	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2034	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2035	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2036	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2037	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1
2038	5.11	17,344	278,188	295,532	77	5.26	82	0.1	0.5	1

[1] BCF=billion cubic feet; Sum of conventional natural gas and coalbed natural gas
[2] Totals may not sum exactly due to rounding

Table B-4
CO_2, CH_4, and N_2O Emissions from Federal Coalbed Natural Gas Production and Downstream Combustion

Year	Federal RFD Natural Gas Production Rate (BCF)[1]	CO_2 (metric tons)			CH_4 (metric tons)			N_2O (metric tons)		
		Production	Combustion	Total[2]	Production	Combustion	Total[2]	Production	Combustion	Total[2]
2019	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2020	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2021	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2022	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2023	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2024	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2025	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2026	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2027	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2028	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2029	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2030	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2031	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2032	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2033	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2034	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2035	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2036	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2037	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1
2038	8.0	16,988	434,570	451,558	99	8.22	107	0.1	0.8	1

[1] BCF=billion cubic feet; Sum of conventional natural gas and coalbed natural gas
[2] Totals may not sum exactly due to rounding

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Appendix C

Coal Reasonably Foreseeable Development Scenario

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Appendix C.
Coal Reasonably Foreseeable Development Scenario

C.1 Introduction

This reasonably foreseeable development (RFD) scenario describes anticipated coal development in the Miles City Field Office (MCFO) over the next 20 years, based on development trends and expected changes to those development trends. The RFD scenario for this effort has been updated from the RFD scenario used for the 2015 Proposed RMP/Final EIS because market conditions have changed; therefore, the BLM has updated the RFD scenario accordingly. The geographic scope of this RFD scenario is limited to coal within the decision area in the SEIS/RMPA.

Estimating the level of future coal development in the decision area has a high amount of uncertainty, because coal development depends on the continued operation of power plants, global coal markets, the ability to bring coal to market, and mining technologies. Energy policies can also shape demand by influencing the incentive and disincentives for coal development, and are often less foreseeable than the above-listed factors. Nevertheless, reasonable estimations of baseline future conditions can be forecasted based on existing mine operations, expected changes in power plant operations, and coal mines actively under planning. The RFD scenario does not account for scenarios based on uncertain or speculative assumptions.

The SEIS/RMPA decision area encompasses approximately 11.7 acres of federal mineral coal in the Power River and Williston Basins, overlapping 12 counties in eastern Montana. The decision area is 98 percent of the 11.9 million acres of subsurface minerals that the BLM administers across 17 counties in eastern Montana.

The information included in this appendix was obtained from mine operators in the MCFO and BLM records.

C.2 Existing Coal Mining Activity

Federal coal is leased for four surface coal mines (Decker, Spring Creek Mine Complex, Savage, and Rosebud), covering approximately 34,700 acres in the decision area. There are no underground coal mining operations use federal coal in the decision area. Approved federal

leases for these mining activities are active until mined out. The majority of active federal leases are held within logical mining units. This allows up to 40 years to complete production within the unit, which includes state, federal, and private coal.

In addition to the coal mines with federal leases, there is one coal mine with no federal leases, the Absaloka Mine, and one forecasted coal mine with no federal leases, Big Metal (discussed below).

C.3 FORECAST OF EXISTING MINING ACTIVITIES

An existing domestic coal license is expected to be renewed during the life of the plan; however, annual production from the license is small relative to existing coal operations in the decision area (less than 20 tons per year). The license is not included in this RFD scenario because its order of magnitude is below the other four mines, and it would not meaningfully contribute to the analysis.

Cloud Peak Energy, owner of the Spring Creek Mine Complex (Spring Creek, Youngs Creek, and Big Metal), has indicated plans to develop coal on Crow Reservation lands. This coal development project—Big Metal—could initiate production sometime during the life of the plan. Coal production resulting from this operation was included in this RFD scenario. This operation, however, would be a part of the Spring Creek Mine Complex. It would use the same outloading facilities and deliver to the same customers; therefore, it would not represent an increase in production from what is expected for the Spring Creek Mine Complex.

Existing lease applications are not forecasted to increase production from existing mines. Production is expected to continue under the scope of existing mine plans.

The BLM considered information collected from operators and did not consider future leasing in the decision area; therefore, this RFD scenario is limited to the approved leases and existing lease applications. As a result, this RFD does not require energy modeling projections. Forecasted production is derived from contract and future estimates provided by the operators and internal BLM data. As a result, energy market modelling projections were not necessary to estimate forecasted production. Any future leasing beyond the approved leases and existing lease applications considered in this RFD scenario would exceed the scope of impacts analyzed in this SEIS/RMPA; this would require additional NEPA analysis.

C.4 COAL PRODUCTION

C.4.1 Data Availability on Coal Production

There are four active mines with federal and nonfederal coal in the Miles City SEIS/RMPA decision area and one mine with nonfederal coal outside the decision area, but within the Miles City planning area. Three of these mines have provided the BLM with data on production. Two mines have not. The BLM used internal data to generate production forecasts into the future for the two mines that did not provide data, taking into consideration power station retirements. These forecasts predict that mines in the decision area would face difficulty securing the replacement of domestic supply coal contracts due to domestic energy production shifting toward natural gas and renewable energy sources.

The information disclosed in **Table C-1** and **Table C-2** reflects coal development totals, aggregating information from the BLM and commercial data.

C.4.2 Market Trends in Coal Production

Over the life of the SEIS/RMPA (20 years), the BLM expects coal production in domestic markets to decrease because of planned power station retirements. Among power plants utilizing coal within the decision area, units 1 and 2 at Colstrip (Rosebud Mine), and the Lewis and Clark (Savage Mine) power plants have indicated that they will close in the next 3 years. Additional closures are likely to occur outside the planning area due to the change in market conditions; however, mines within the planning area are not the sole provider for these latter plants.

It should be noted that a significant percentage of coal is not combusted in the planning area and is shipped to foreign markets; this trend is anticipated to persist or increase throughout the duration of the plan. Global market demand and the associated demand on the export of coal are expected to increase over this time horizon, following existing trends and with no foreseeable countervailing influence (EIA 2019, IEA 2019). The net outcome of this on coal in the decision area is uncertain.

Two of the five existing mines in the planning area export coal to global markets. The three existing mines that do not export coal do not meet coal quality requirements for export coal supply contracts; therefore, global market demand would not influence them in the same way.

C.4.3 Coal Production

About 38.7 million tons of coal will be mined from the decision area each year, totaling 775 million tons of coal over the life of the SEIS/RMPA and affecting approximately 9,730 acres (based on current lease applications). Of the total forecasted production (approximately 775 million tons), it is anticipated that approximately 58 percent (450 million tons) would be federal coal, based on production between 2016 and 2018. The forecasted disturbance of land attributed to the mining of federal coal would be proportional (5,640 acres).

C.5 Forecasted Coal Production by Year, Ownership, and Lease Availability

Table C-1
Forecasted Coal Production in the MCFO SEIS/RMPA Decision Area 2019–2038

Year	Total Production (million tons)	Federal Production (million tons)	Nonfederal Production (million tons)
2019	31.86	18.5	13.4
2020	43.86	25.4	18.4
2021	43.56	25.3	18.3
2022	42.41	24.6	17.8
2023	41.26	23.9	17.3
2024	41.26	23.9	17.3
2025	41.26	23.9	17.3

Year	Total Production (million tons)	Federal Production (million tons)	Nonfederal Production (million tons)
2026	41.26	23.9	17.3
2027	37.26	21.6	15.6
2028	37.26	21.6	15.6
2029	37.26	21.6	15.6
2030	37.26	21.6	15.6
2031	37.26	21.6	15.6
2032	37.26	21.6	15.6
2033	37.26	21.6	15.6
2034	37.26	21.6	15.6
2035	37.26	21.6	15.6
2036	37.26	21.6	15.6
2037	37.26	21.6	15.6
2038	37.26	21.6	15.6
Total[1]	**775**	**450**	**325**

[1] Rounded for clarity (unrounded values: 773.8, 448.8, 325.0)

Table C-2
Disposition of Coal in the MCFO SEIS/RMPA Decision Area 2019–2038

Leasing Disposition / Status		Coal (million short tons)
Existing Leases (valid existing rights)	Federal Leased	377
	Nonfederal Leased[1]	198
	Nonfederal Leased (not permitted)[1, 2]	152
	TOTAL	**727**
Lease Applications being Pursued	Existing Lease Applications	405
	Nonfederal Unleased[3]	1,800
	TOTAL	**2,205**

[1] American Indian coal is classified under nonfederal coal.
[2] Lands are leased for coal mining, but necessary permits for operations have not been obtained.
[3] This represents coal that the mining companies have expressed interest in mining on nonfederal land during the life of the plan.

C.6 REFERENCES

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Haacke, J. E., D. C. Scott, L. M. Osmonson, J. A. Luppens, P. E. Pierce, and J. A. Gunderson. 2012. Assessment of Coal Geology, Resources, and Reserves in the Montana Powder River Basin. Publications of the US Geological Survey. 119. Internet website: http://digitalcommons.unl.edu/usgspubs/119.

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Appendix D

Coal Market Supplementary Report

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
ACR	Annual Coal Report
AEO	Annual Energy Outlook
BEA	US Bureau of Economic Analysis
BP	British Petroleum
BGR	Federal Institute of Geosciences and Natural Resources
BLM	US Department of the Interior, Bureau of Land Management
EIA	Energy Information Administration, US Department of Energy
IEA	Institute for Energy Information
PRB	Powder River Basin
MCFO	Bureau of Land Management, Miles City Field Office
MSHA	US Mine Safety and Health Administration
MMBtu	million British thermal units
Mt	million tons
RFD	reasonably foreseeable development
RMP	resource management plan
RMPA	resource management plan amendment
SEIS	supplemental environmental impact statement
US	United States
WCR	Western coal region

Appendix D.
Coal Market Supplementary Report

D.1 INTRODUCTION

The Bureau of Land Management (BLM) Miles City Field Office (MCFO) in Montana has been court ordered to fulfill a supplemental environmental impact statement/resource management plan amendment (SEIS/RMPA) in support of the 2015 Proposed RMP/Final EIS submitted by the BLM MCFO. The BLM wrote this appendix in support of **Section 3.9**, Economic Considerations, of the 2019 SEIS/RMPA. The appendix further describes the clarifications the BLM has made to address the projections of coal production in the context of the fuel generation energy mix in the electric utility market, with an emphasis on coal and natural gas supply, demand, and price structures. This analysis utilizes data from the Energy Information Administration (EIA), International Energy Agency (IEA), Mine Safety and Health Administration (MSHA), and other resources that analyze domestic and global markets.

Economic considerations disclosed in the SEIS/RMPA are a result of the BLM updating the reasonably foreseeable development (RFD) scenario in response to the need to update the coal screening analysis. Based on information gathered from existing mining operations in the MCFO and associated mine permits received, the BLM updated the RFD scenario from what was considered in the 2015 Proposed RMP/Final EIS. Because of this, there is an updated economic forecast from what was disclosed in the 2015 Proposed RMP/Final EIS.

The economic forecast depends on coal market conditions, both domestically and globally. This supplemental appendix summarizes the current conditions of the United States (US) domestic energy market and the global energy market in the context of coal produced within the MCFO.

D.2 ECONOMIC ANALYSIS AREA

The economic analysis area contains coal production occurring in the Western coal region (WCR) of the United States. The WCR contains the Powder River Basin (PRB), which produces approximately 43 percent of total US coal. Because of the large proportion of coal that the PRB produces, data sources, such as the EIA and MSHA, typically report production data for the WCR in two subregions: the PRB and the remainder of the WCR. Mines located within the MCFO produce coal in both subregions.

In order to understand the changes in domestic and global markets, given the difficulty in analyzing the various market factors, this appendix pulls analysis from the Annual Energy Outlook (AEO) 2019 (EIA 2019a) and other reports from the EIA to best understand US domestic markets. To best understand global markets, this appendix pulls analysis from reports written by the IEA, Federal Institute of Geosciences and Natural Resources (BGR) from Germany, and analysis from global energy market economists.

D.2.1 Miles City Field Office – Montana

The supplementary EIS that this Appendix supports specifically analyzes the economic effects associated with BLM-forecasted coal production in Big Horn, Rosebud, and Richland Counties within the jurisdiction of the BLM MCFO. In addition, Yellowstone County is included in this analysis per Montana intercounty commuting patterns for regional coal employment. Production in the socioeconomic analysis area is surface coal. Production within the MCFO primarily occurs within the PRB, but also has production in the remainder of the WCR. Local mine forecasts, optimistic toward the US coal export market, drive production forecasts for the MCFO.

D.3 HISTORICAL DOMESTIC PRODUCTION AND EMPLOYMENT

The US holds the largest single-region coal reserves in the world, accounting for approximately 30 percent of global reserves. National production has maintained at around 1 billion million short tons (MMst) per year from 1990 until 2015 (Hook and Aleklett 2009; CRS 2017; BGR 2017). US coal reserves are concentrated to three regions, the Appalachian coal region, Interior coal region, and the Western coal region, with each region containing coal producing basins (EIA 2018a).

The Appalachian coal region consists of Alabama, eastern Kentucky, Maryland, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. The EIA and MSHA primarily report coal production and employment data from the northern Appalachian basin, the central Appalachian basin, and the southern Appalachian Basin (MSHA 2018). In 2017, the Appalachian coal region produced 26 percent of total US coal production (EIA 2018a).

The Interior coal region contains Arkansas, Illinois, Indiana, Kansas, Louisiana, Mississippi, Missouri, Oklahoma, Texas, and west Kentucky. Because Illinois produces 33 percent of coal in the Interior coal region, the EIA and MSHA report coal production and employment data for the Illinois coal basin and the remainder of the Interior coal region separately (EIA 2018a; MSHA 2018; EIA 2018c). In 2017, the Interior coal region produced approximately 19 percent of total US coal production (EIA 2018a).

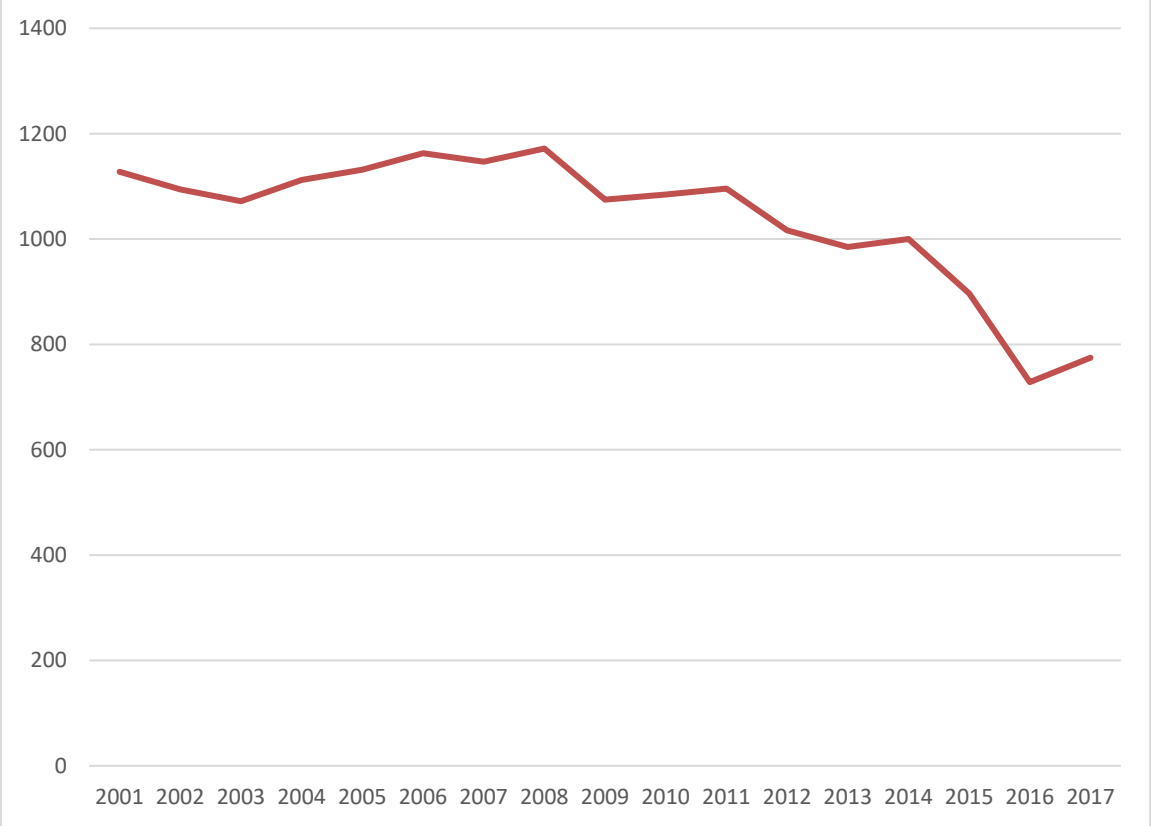
The Western coal region contains Alaska, Arizona, Colorado, Montana, New Mexico, North Dakota, Utah, Washington, and Wyoming. The PRB, within the Western coal region, is the largest coal producing area in the US, accounting for approximately 43 percent of total US coal production (MSHA 2018; EIA 2018a). The EIA and MSHA report coal production and employment data for the PRB and the remainder of the WCR separately (MSHA 2018). In 2017, the WCR produced 56 percent of total coal production in the US (EIA 2018a).

US Production

Coal production had been above 1,000 MMst prior to 2014, with production reaching its peak in 2008, before declining in recent years. In 2001, coal production was approximately 1,090 MMst,

while in 2017, production was approximately 775 MMst (MSHA 2018).[1] Coal production was relatively stable from 2001 through 2008, maintaining levels between 1,100 MMst and 1,200 MMst. Production began to decline between 2008 and 2014, from 1,172 MMst to 1,000 MMst. Significant declines did not begin until after 2014, where production fell to 897 MMst in 2014, 728 MMst in 2016, and 775 MMst in 2017. Changes were primarily driven by market factors, which will be described in further detail in **Section D.3** of this report. **Diagram D-1**, below, describes the long-run trend of domestic US coal production.

Diagram D-1
Historical US Production 2001–2017 (Million Short Tons)



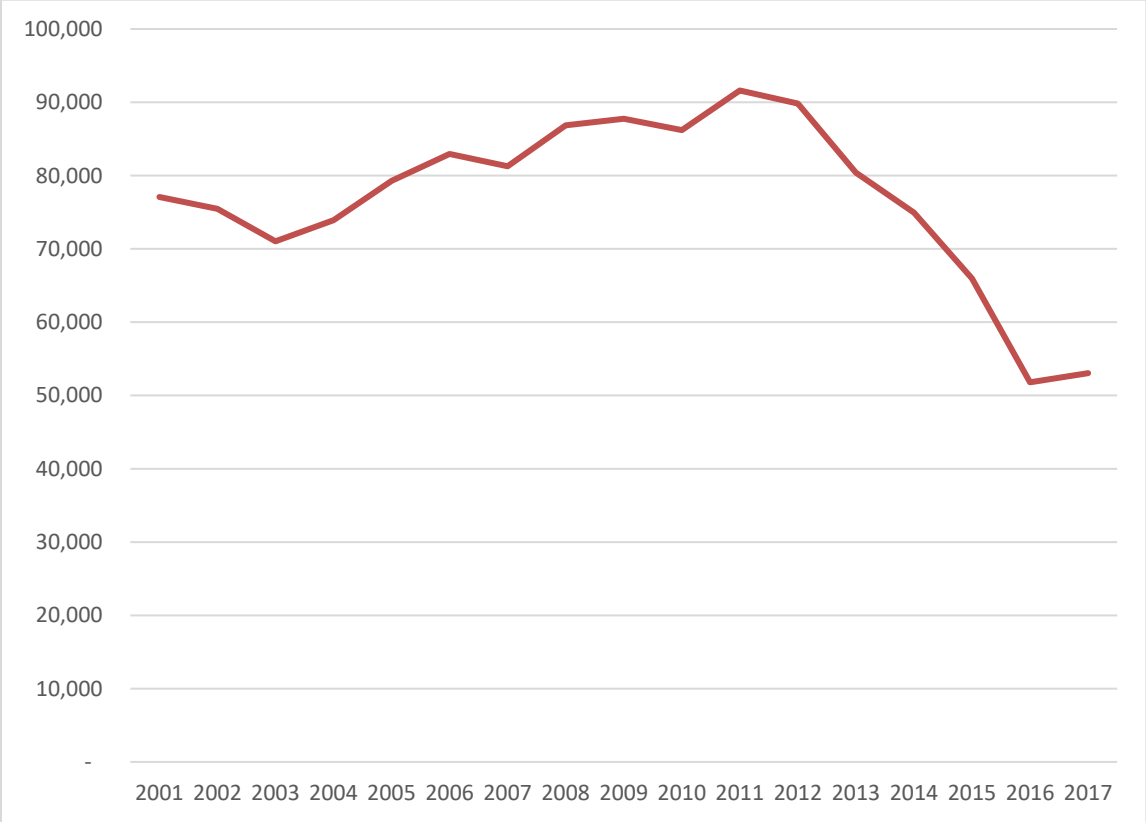
Between 2001 and 2008, the average annual rate of change in production was approximately 0.6 percent. Between 2008 and 2014, the average annual rate of change in production was approximately -1.8 percent, marginally lower than those between 2001 and 2008. Major declines in coal production within the MCFO occurred between 2014 and 2017, where the average annual rate of change in production was approximately -5.3 percent. For the full 16-year period, the average annual rate of change was approximately -2.1 percent (MSHA 2018).

[1] The MSHA provides coal production levels from 1997 to 2017; however, the MSHA did not collect coal employment data until 2001. To maintain consistency between production and employment, this analysis uses 2001–2017 MSHA data for production.

US Employment

US coal employment levels had been steadily increasing between 2001 and 2011, before declining between 2011 and 2016. The US coal industry saw growth in employment levels from 2016 to 2017. In 2001, approximately 77,088 persons were employed in the coal industry. Employment marginally declined from 2001 to 2003, where employment levels were at approximately 71,023 persons. Employment grew, however, from 2003 through its peak in 2011, where employment reached 91,611 persons. Employment levels began to decline following 2011 through 2017, where employment was at approximately 53,051 persons (MSHA 2018). **Diagram D-2**, below, visualizes the change in employment levels.

Diagram D-2
Historical US Coal Employment 2001–2017 (Annual Average Employment)



Between 2001 and 2008, the average annual rate of change in employment was approximately 1.8 percent. Between 2008 and 2014, the average annual rate of change in employment was approximately -1.0 percent, mostly due to declines in employment experienced by the industry following 2011. Between 2014 and 2017, the average annual rate of change in employment was approximately -9.5 percent. For the full 16-year period, the average annual rate of change was approximately -2.0 percent (MSHA 2018).

D.3.1 Miles City Field Office

Montana is part of the WCR, the largest coal producing region in the US. In 2017, the WCR produced a total of 431 MMst, accounting for approximately 56 percent of total US coal

production (MSHA 2018). The PRB, within the WCR, produced 334 MMst, accounting for approximately 77.5 percent of total coal production in the WCR and 43.1 percent of total coal production in the US (MSHA 2018; EIA 2018a). Given the proportion of production occurring in the PRB, the EIA and MSHA report coal production and employment data for the PRB and the remainder of the WCR separately (MSHA 2018). While Montana coal production primarily occurs within the PRB, coal production also occurs in areas defined by the EIA and MSHA as separate from the PRB but within the WCR (MSHA 2018).

Within the WCR, the PRB produced 334 MMst of surface coal out of 16 mines; the remainder of the WCR produced 68 MMst of surface and underground coal, accounting for 8.8 percent of total US coal, out of 20 mines (MSHA 2018).

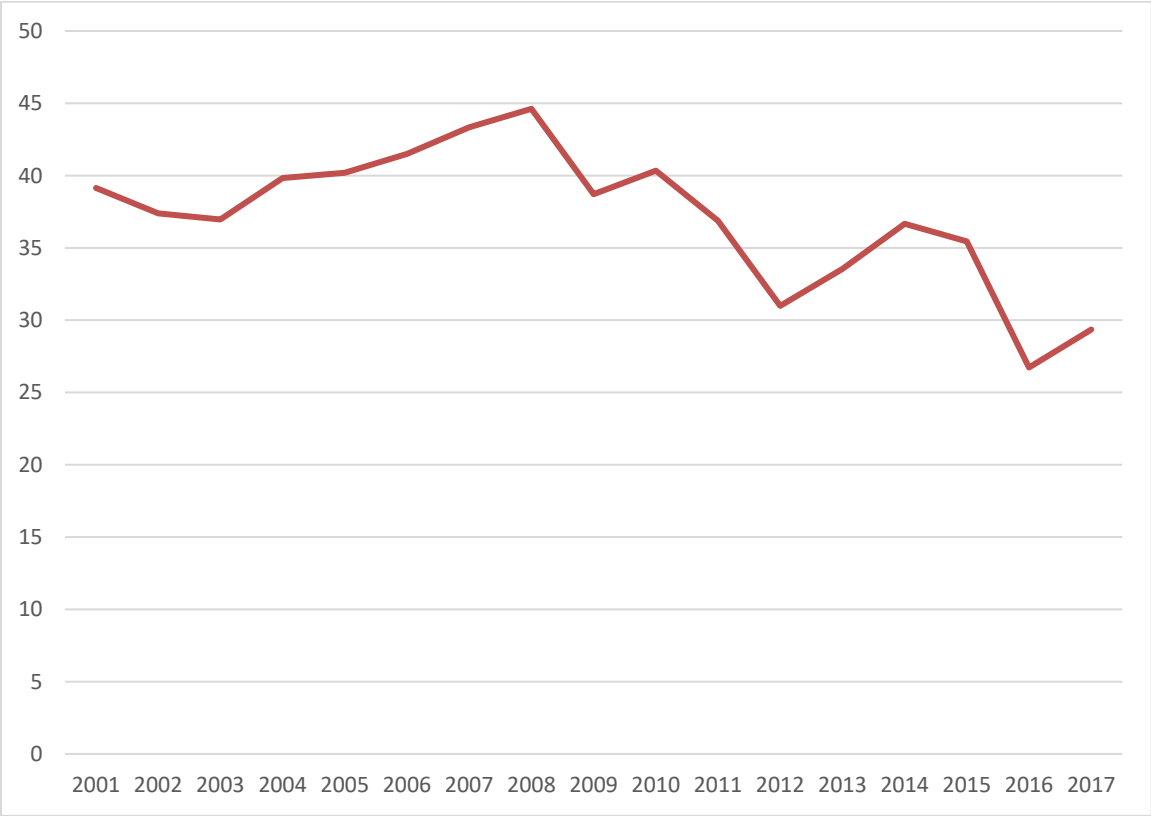
In 2017, Montana was the sixth-highest coal producer in the US, with approximately 35 MMst mined within the state (EIA 2018c; MSHA 2018). Historically, the Montana coal industry has been an important economic driver for the state, accounting for a total employment contribution of 6,588 jobs and generating approximately $774 million in total contributions to state gross domestic product in 2015 (National Mining Association 2016). Coal production in Montana also contributes to the Montana Coal Severance Tax Trust Fund, which supports a variety of public infrastructure projects throughout the state (Montana Department of Commerce 2017; Montana Legislative Fiscal Division 2015).

Capacity utilization rates represent the ratio of annual coal produced to annual productive capacity; they and help identify the operating rate of a coal mine. They identify the proportion of output realized given the constraints to mine inputs. In 2017, Montana's capacity utilization rate for surface coal production was 70.2 percent, which is higher than the US rate of 69.9 percent (EIA 2018c).

Miles City Field Office Production

Mines that produce coal within the MCFO are located in Big Horn, Rosebud, and Richland Counties. Coal production within the MCFO had been steadily increasing prior to 2008, increasing from 39 MMst in 2001 to 45 MMst in 2008. Production began to fall following 2008, from 39 MMst in 2009 to 31 MMst in 2012. There was a slight increase in production following 2012, with production increasing to 37 MMst in 2014; however, declines began again following 2014, to 35 MMst in 2015 and 27 MMst in 2016. There was a slight increase in production from 2016 to 29 MMst in 2017 (MSHA 2018). **Diagram D-3**, below, visualizes the data.

Diagram D-3
MCFO Historical Production 2001-2017 (Million Short Tons)



Between 2001 and 2008, the average annual rate of change in production was approximately 2.0 percent. Between 2008 and 2014, the average annual rate of change in production was approximately -1.9 percent, driven primarily by declines immediately following 2008. Between 2014 and 2017, the average annual rate of change in production fell to -2.2 percent. For the 16-year period between 2001 and 2017, the average annual rate of change was approximately -1.3 percent (MSHA 2018).

Coal production within the MCFO occurs in Big Horn, Rosebud, and Richland Counties on five mines. Big Horn County contains the Decker Mine, Absaloka Mine, and the Spring Creek Mine Complex; Rosebud County contains the Rosebud Mine & Crusher/Conveyer; and Richland County contains the Savage Mine.

In 2017, the Spring Creek Mine Complex produced the most coal in the planning area, accounting for approximately 12.7 MMst, or 43.3 percent of the socioeconomic analysis area total (MSHA 2018). **Table D-1** presents 2017 coal production by mine.

Table D-1
Socioeconomic Analysis Area Production by Mine, 2017

Mine Name	County	2017 Coal Production (MMst)
Decker Mine	Big Horn	4.2
Absaloka Mine	Big Horn	3.6
Spring Creek Mine Complex	Big Horn	12.7
Savage Mine	Richland	0.3
Rosebud Mine & Crusher/Conveyer	Rosebud	8.6
Planning Area Total	**-**	**29.3**

Source: MSHA 2018

Miles City Field Office Coal Employment

Coal industry employment trends within the MCFO varied from production trends during the 16-year period. Industry employment initially fell from 843 persons in 2001 to 683 persons in 2004. Following 2004, the coal industry in the MCFO experienced increases in employment through 2008, from 782 in 2005 to 990 in 2008. Coal employment remained relatively stable following 2008 through 2011, where employment remained above 950 persons. In 2012 and 2013, employment fell to 913 and 914, respectively; however, in 2014 and 2015, coal employment in the MCFO reached its highest levels in the 16-year period, with 996 and 1,017, respectively. Following 2015, coal employment in the region began to decline to 920 in 2016 and 894 in 2017 (MSHA 2018). See **Diagram D-4**.

Between 2001 and 2008, the average annual rate of change in coal employment was approximately 2.7 percent. Between 2008 and 2014, the average annual rate of change in employment fell to approximately 0.5 percent. Between 2014 and 2017, the first time the region experienced annual average declines, the average annual rate of change in employment was approximately -0.3 percent. For the 16-year period between 2001 and 2017, the average annual rate of change in employment was approximately 0.6 percent (MSHA 2018).

Employment levels varied across mines and counties in the socioeconomic analysis area. In 2017, a total of 894 were employed in the socioeconomic analysis area (MSHA 2018). The Rosebud Mine & Crusher/Conveyer, located in Rosebud County, represented the majority of coal employment, accounting for 36.6 percent of coal employment in the socioeconomic analysis area (MSHA 2018). At the county level, Big Horn County held 553 coal jobs, Rosebud held 327 coal jobs, and Richland County held 14 coal jobs (MSHA 2018). See **Table D-2** for more information on employment distribution.

Coal employment data identify the relative intensity of the coal industry to total employment. In 2017, Big Horn County had the highest percentage of coal employment relative to total employment at 9.4 percent, while Richland County had the lowest at 0.16 percent of total employment in the coal industry (MSHA 2018; BEA 2019). For comparison, Montana had 0.17 percent of total employment in the coal industry, while the United States had 0.027 percent of the employed labor force in the coal industry (EIA 2018c; BEA 2019). While coal employment may not provide major employment contributions to state or national totals, they do provide a larger contribution to the counties within the socioeconomic area of analysis. See **Table D-3**, below, for more detailed information on coal employment numbers.

Diagram D-4
MCFO Historical Coal Employment 2001–2017 (Annual Average Employment)

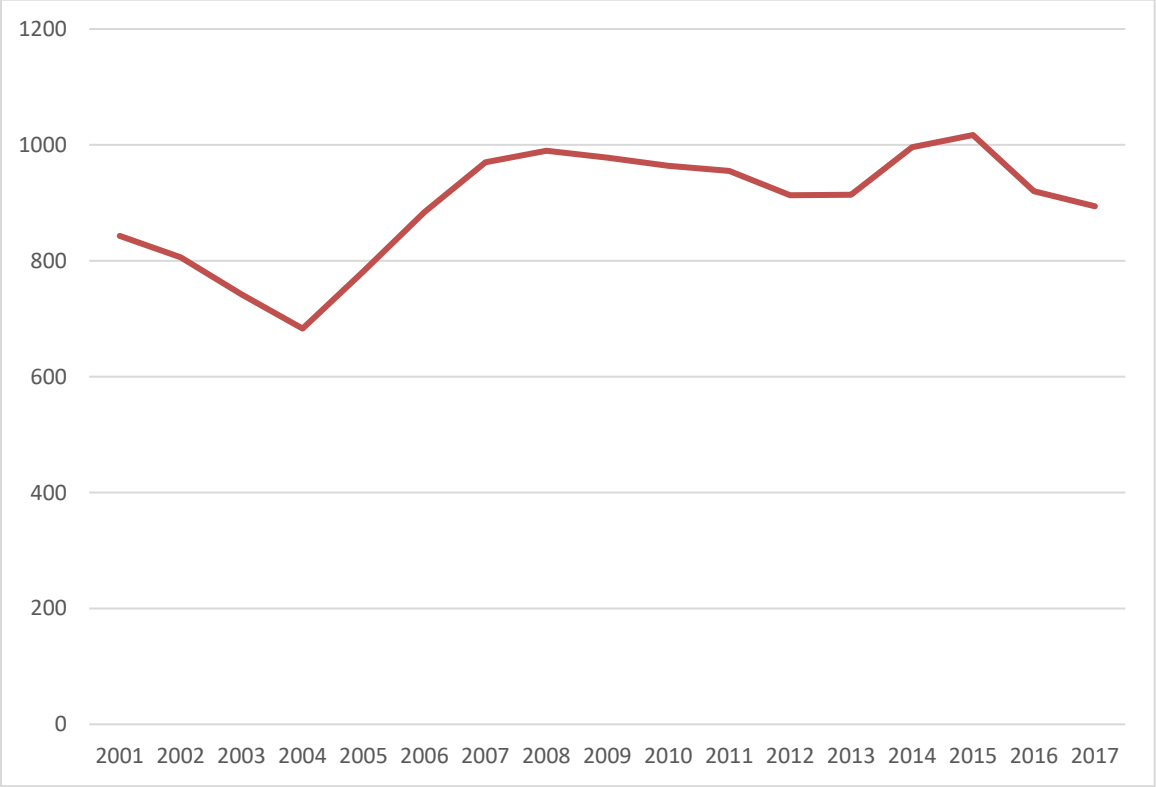


Table D-2
Socioeconomic Analysis Area Employment by Mine, 2017

Mine Name	County	Average Annual Employment
Decker Mine	Big Horn	153
Absaloka Mine	Big Horn	139
Spring Creek Mine Complex	Big Horn	261
Savage Mine	Richland	14
Rosebud Mine & Crusher/Conveyer	Rosebud	327
Planning Area Total	**-**	**894**

Source: MSHA 2018

Table D-3
Socioeconomic Analysis Area Coal Employment Ratio, 2017

County	Coal Employment	Total Employment	Percentage Coal Employment
Big Horn	553	5,859	9.44
Richland	14	8,397	0.16
Rosebud	327	5,580	5.86

Source: MSHA 2018; BEA 2019; EIA 2018c

Location quotients identify the concentration of a particular industry in a specified region compared with a larger reference region. They determine which industries make a region unique, while also identifying regional export characteristics. Values of location quotients are calculated by comparing an industry's share of regional employment against the same industry's share of national employment; they can be interpreted as the number of times more concentrated an industry is in a specified region compared with a larger reference region (Sentz 2011). In 2017, the coal industry in Big Horn County was almost 56 times more concentrated than the state of Montana, and over 349 times more concentrated than the United States. See **Table D-4**, below, for more information.

Table D-4
Socioeconomic Analysis Area Coal Location Quotient, 2017

County	Location Quotient to MT	Location Quotient to US
Big Horn	55.5	349.63
Richland	0.94	5.93
Rosebud	34.5	217.04
Montana	X	6.29

Source: MSHA 2018; BEA 2019; EIA 2018c

D.4 MARKET TRENDS

This supplementary appendix analyzes trends in the US energy market and the global coal market. In general, coal production in the domestic US market is expected to decrease. This is due to retirements of less economic coal power stations driven by the abundance and lower prices of US natural gas. While global coal demand is expected to increase, driven primarily by coal power generation in China and India, US exports are not expected to increase due to competition from suppliers closer to those markets (IEA 2019; EIA 2019a).

Forecasted reductions in coal demand for the fuel generation energy mix has the potential to reduce coal production in the socioeconomic analysis area. Reductions in coal production would result from the coal mines' inability to compete for future supply contracts.

While the US coal market share for electricity generation is not expected to increase over the 20-year planning horizon of the SEIS/RMPA, the Decker Mine and Spring Creek Mine Complex are projecting increases in exported coal for the socioeconomic analysis area. Export-driven coal production would rely on regional competitiveness compared with global suppliers closer to major global coal consumers, such as China and India. The economic viability of export-driven coal production is also dependent on other factors outside BLM management decisions, such as exchange rates, trade barriers, and changes in transportation costs.

D.4.1 US Domestic Market

This section incorporates by reference Chapter 4 of the Wright Area Remand Final Environmental Assessment, which is summarized below (BLM 2019).

Coal produced in the US is generally used to fire coal-powered power plants for electricity generation. In order to understand the changes in domestic and global markets, and the future of electricity generation fuel shares, this appendix pulls analysis from the Annual Energy Outlook

(AEO) 2019 (EIA 2019a) and other reports from the EIA. The AEO 2019 uses the National Energy Modeling System (NEMS) to forecast energy supply, demand, and prices approximately 30 years into the future (EIA 2019a; EIA 2019b). National aggregation of economic factors related to energy is not sufficient to account for the physical and economic characteristics unique to geographical regions (Stevens et al. 1979); the NEMS analyzes energy characteristics at a regional level to account for these differences (EIA 2019a). To account for the uncertainty inherent to energy markets, the NEMS uses a reference case and six side cases (high/low oil price, high/low oil and gas resource and technology, and high/low economic growth).

As discussed in the Wright Area Remand Final EA (BLM 2019), supply and demand within the context of the electric power system does not easily conform to the norms of the general supply and demand model of other commodities. This is due to multiple factors, including 1) limited storage capacity, which requires production and supply on demand, 2) utilities within the traditional vertically integrated system with monopolies within a geographic region, and 3) other nonmarket mechanisms, including spot market price caps, operating reserve requirements, non-price rationing protocols, and administrative protocols for managing system emergencies (BLM 2019).

In 2018, the AEO 2019 found that coal accounts for approximately 28 percent of US electric generation, while natural gas accounts for approximately 34 percent (EIA 2019a). The decline in natural gas prices has decreased the competitiveness of coal and is projected to lead to the continued dominance of natural gas in the fuel generation energy mix through 2050. The average costs of coal and natural gas experienced some volatility between 2008 and 2017, primarily due to the instability of markets following the 2008–2009 recession (EIA 2018b) and other factors, including the shale gas boom and growth of renewable sources in the electricity generation market (BLM 2019). Coal experienced increases in average cost (dollars per MMBtu) from 2008 to 2011, while natural gas saw a decline over the same period (EIA 2018b). Average annual growth rates for coal from 2008 through 2017 were 1.7 percent, while average annual growth rates for natural gas were -3.5 percent (EIA 2018b). **Table D-5** describes the average costs of coal and natural gas, coupled with annual growth rates.

The projected lower energy demand of coal, coupled with the retirement of inefficient coal-fired power plants, is expected to result in the reductions of US coal production. The reduced competitiveness of coal-fired energy generation is projected to lead to the retirements of inefficient coal-fired power plants through 2025 (EIA 2019a). AEO 2019 projects domestic coal production to decrease between 2018 and 2035, from 762 million short tons in 2018 to 608 million short tons in 2035, before stabilizing at around 600 million short tons through the remainder of the analysis period in 2050 (EIA 2019a). Coal production in the WCR is projected to decline by 85 million short tons between 2018 and 2035 (EIA 2019a).

The decline in US coal production is driven by the competitive price and reduced costs of natural gas. The share of coal in the US fuel generation energy mix is expected to decline in all cases from 2018 through 2050, driven primarily by the lower natural gas prices and declining costs of renewable energy. Coal is expected to decline from 28 percent in 2018 to 17 percent in 2050; renewables are expected to grow from 18 percent in 2018 to 31 percent in 2050. Natural gas is expected to rise from 34 percent in 2018 to 39 percent in 2050, with natural gas retaining the dominant market share of electricity generation (EIA 2019a).

Table D-5
Average Cost of Coal and Natural Gas 2007–2017

Period	Coal Average Cost ($ per MMBtu)	Coal Cost Annual Growth Rate (percent)	Natural Gas Average Cost ($ per MMBtu)	Natural Gas Cost Annual Growth Rate (percent)
2007	1.77	-	7.11	-
2008	2.07	16.9	9.02	26.9
2009	2.21	6.8	4.74	-47.5
2010	2.27	2.7	5.09	7.4
2011	2.39	5.3	4.72	-7.3
2012	2.38	-0.4	3.42	-27.5
2013	2.34	-1.7	4.33	26.6
2014	2.37	1.3	5.00	15.5
2015	2.22	-6.3	3.23	-35.4
2016	2.11	-5.0	2.87	-11.1
2017	2.06	-2.4	3.37	17.4

Source: EIA 2018b

D.4.2 US Export Market and Global Market Demand

Global market demand is expected to increase over the next 20 years, driven by coal-powered generation in China and India; however, US exports are expected to remain stable (IEA 2019; EIA 2019a).

In 2017, global coal consumption increased for the first time in 4 years, driven by population growth and market demand in the Asia Pacific region. Global coal consumption increased by 1 percent in 2017, the first positive change in coal consumption since 2013, driven by consumption in India, which grew by 25 MMst, and China, which grew by 6 MMst (BP 2018). Global coal production also increased in 2017 by approximately 3.2 percent from 2016 levels. This was led by China and the US, which increased production by 80 MMst and 33 MMst, respectively (BP 2018).

Coal remains the most abundant of available world energy resources. It accounts for approximately 89.1 percent, while natural gas, the dominant US domestic alternative to coal, is the second-most abundant resource at 5.8 percent (BGR 2017). Given the type and quality of US coal, US exports are primarily used to support the global power generation as the dominant portion of the global fuel generation energy mix.[2] The coal proportion of the global fuel generation energy mix has remained relatively stable since 1997, with coal accounting for 38 percent in 1998 and 38 percent in 2017 (Spencer 2018).

Global coal production increases are mainly due to domestic policy in major coal consuming countries. In 2016, the largest coal producers were China, India, and the United States; however, India was the only country to boost production from 2015 levels, approximately 3.7 percent. China and the US both saw declines of 9.4 percent and 20.6 percent, respectively, over

[2] The fuel generation energy mix is the category of energy sources used for energy generation

the same time frame (BGR 2017). Approximately 1,445 MMst, or 20 percent of produced coal, was traded in global markets, with 1,248 MMst, or 86.4 percent of traded coal, transported by sea (BGR 2017).

The Asia Pacific region drives both supply and demand for the global coal market. In 2017, Asia Pacific had the most proven coal reserves, accounting for approximately 41 percent of the global total located primarily within Australia, China, and India (Spencer 2018). Asia Pacific drives coal consumption, primarily in China, consuming 2,119 MMst or 50.7 percent of the global share, and India, consuming 475 MMst or 11.4 percent of the global share (IEA 2019; BP 2018).

As such, the Asia Pacific region also drives the import/export market. The top coal importers in 2016 were China at 287 MMst, India at 214 MMst, and Japan at 213 MMst. The top exporters were Australia at 439 MMst, Indonesia at 414 MMst, and Russia at 186 MMst (BGR 2017).

Global markets are difficult to predict. This is because the factors that affect domestic market demand, as described in **Section D.3**, also occur in the global market, but they are coupled with trade barriers, transportation costs, and relative intensity of exchange rates.

D.5 REFERENCES

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Appendix E

Public Comments and BLM Response

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Appendix E.
Public Comments and BLM Response

This appendix presents comments the BLM received on the Miles City Field Office Draft SEIS and RMPA. It also includes a description of the public comment process, how all comments were considered, and responses to all substantive comments.

E.1 DRAFT RMPA/SEIS COMMENT PROCESS

The National Environmental Policy Act (NEPA) requires that all substantive comments received on an EIS, before an agency reaches a decision, must be considered, to the extent feasible, and that agencies must respond to all substantive written comments submitted during the public comment period (40 CFR 1503.4). Comments must be in writing (including paper or electronic format or a court reporter's transcript taken at a formal public meeting or hearing), substantive, and timely, in order to merit a written response.

Although the BLM diligently considered each comment letter, the comment analysis process involved determining if a comment was substantive or not. In performing this analysis, the BLM relied on Section 6.9.2, Comments, in the BLM NEPA Handbook H-1790-1 to determine what constituted a substantive comment.

A substantive comment does one or more of the following

- Questions, with a reasonable basis, the accuracy of the information or analysis in the EIS
- Questions, with a reasonable basis, the adequacy of the information or analysis in the EIS
- Presents reasonable alternatives other than those in the Draft EIS that meet the purpose and need of the proposed action and address significant issues
- Questions, with a reasonable basis, the merits of an alternative or alternatives
- Causes changes in or revisions to the proposed action
- Questions, with a reasonable basis, the adequacy of the planning process itself

Additionally, the BLM's NEPA handbook identifies the following types of substantive comments:

- Comments on the Adequacy of the Analysis—Comments that express a professional disagreement with the conclusions of the analysis or assert that the analysis is inadequate are considered substantive; they may or may not lead to changes in the Final EIS. Interpretations of analyses should be based on professional expertise. Where there is disagreement within a professional discipline, a careful review of the various interpretations is warranted. In some cases, public comments may necessitate a reevaluation of analytical conclusions. If, after reevaluation, the BLM Authorized Officer responsible for preparing the EIS does not think that a change is warranted, the response should provide the rationale for that conclusion.
- Comments That Identify New Impacts, Alternatives, or Mitigation Measures—Public comments on a Draft EIS that identify impacts, alternatives, or mitigation measures that were not addressed in the draft are considered substantive. This type of comment requires the BLM Authorized Officer to determine if it warrants further consideration; if so, he or she must determine if the new impacts, new alternatives, or new mitigation measures should be analyzed in the Final EIS, in a supplement to the Draft EIS, or in a completely revised and recirculated Draft EIS.
- Disagreements with Significance Determinations—Comments that directly or indirectly question, with a reasonable basis, determinations on the significance or severity of impacts are considered substantive. A reevaluation of these determinations may be warranted and may lead to changes in the Final EIS. If, after reevaluation, the BLM Authorized Officer does not think that a change is warranted, the BLM's response should provide the rationale for that conclusion.

Comments that failed to meet the above description were considered non-substantive.

The Draft SEIS/RMPA was published on May 17, 2019, and the 90-day comment period officially ended on August 15, 2019. The BLM received written comments by mail, fax, email, online comment form via the project website in ePlanning (https://go.usa.gov/xmbE4), and handwritten submissions at public meetings.

The BLM held one public meeting during the comment period, on July 17, 2019, in Miles City, Montana. Comments received covered a wide spectrum of thoughts, opinions, ideas, and concerns. The BLM recognizes that commenters invested considerable time and effort to submit comments on the Draft SEIS/RMPA. It developed a comment analysis method to ensure that all comments were considered, as directed by NEPA regulations. This systematic process ensured that all substantive comments were tracked and considered.

On receipt, each comment letter was assigned an identification number and logged into a database that allowed the BLM to organize, categorize, and respond. Substantive comments from each letter were coded to appropriate categories, based on content, and the link to the commenter was retained. The categories generally follow the sections presented in the Draft SEIS/RMPA, though some related to the planning process or editorial concerns.

A total of 33 comment letter submissions were received. Some commenters expressed personal opinions or preferences, their comments had little relevance to the adequacy or accuracy of the

Draft SEIS/RMPA, or the comments were on management actions that are outside the scope of this NEPA analysis. These commenters did not provide specific information to assist the BLM in making a change to the existing action alternatives, did not suggest new alternatives within the scope of this SEIS, and did not take issue with methods used in the Draft SEIS/RMPA. Because of this, these comments are not addressed further in this document.

The BLM read, analyzed, and considered all comments of a personal or philosophical nature and all opinions, feelings, and preferences for one element or one alternative over another; however, because such comments were not substantive, the BLM did not respond to them. It is also important to note that, while the BLM reviewed and considered all comments, none were counted as votes. The NEPA public comment period is neither an election nor does it result in a representative sampling of the population. Therefore, public comments are not appropriate to be used as a democratic decision-making tool or as a scientific sampling mechanism.

Comments that recommended additional studies, data, or scientific literature to be incorporated into the analysis were reviewed by subject matter experts; new information and citations were incorporated into the Proposed RMP/Final EIS, as appropriate. Comments citing editorial changes to the document were reviewed and incorporated. The Final EIS has been technically edited and revised to fix typos, missing references, definitions, and acronyms, and it provides other clarifications as needed.

E.2 HOW TO READ THIS APPENDIX

The BLM assigned a number to every unique communication received during the Draft SEIS/RMPA public comment period. **Table E-1** contains all substantive comments with the BLM's responses and is organized by category. Commenter names and applicable organizations or agencies are provided for commenters who submitted letters but did not request their information to be withheld.

Table E-1
Substantive Public Comments and BLM Responses

Organization Name	Comment Text	Response Text
	Best Available Information	
Western Organization of Resource Councils, et al.	In April 2016, researchers at Harvard University and Vulcan Philanthropies released a paper that utilized ICF's Integrated Planning Model to analyze the market and climate impacts of various federal coal policies, including a scenario where BLM phased out federal coal leasing entirely.6 The analysis found that in a scenario where the Clean Power Plan is not implemented, reducing federal coal leasing, or ending it outright, would result in a slight up-tick in mining non-federal coal reserves, but that the market would also shift to electricity generation by gas and renewables, which would result in a substantial reduction in greenhouse gas emissions from the electricity sector.7 6 Todd Gerarden et al., "Federal Coal Program Reform, the Clean Power Plan, and the Interaction of Upstream and Downstream Climate Policies," (April 2016). Attached as Exhibit 6.7 Id.	Phasing out federal leasing at the national level is beyond the scope of this SEIS, which is specific to the Miles City Field Office. The RFD forecast indicates that area mine operators have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the operators can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. An energy market model is not necessary to inform the management decision.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	The attached report of economist Dr. Thomas Power11 analyzes available energy economy models and concludes that the two models best suited to this type of analysis, based on the prior use by other agencies and the known characteristics of the models, are EIA's National Energy Modeling System, used to generate its widely cited Annual Energy Outlook reports, and ICF International's Integrated Planning Model ("IPM"), used by EPA to evaluate market responses to various policy proposals since at least 2004.12 11 Thomas Michael Power and Joel M. Brown, "Assessing the Ability of Contemporary Models to Calculate the GHG Implications of Federal Coal Leasing Decisions and Other Federal Energy Management Decisions," Power Consulting, (May 21, 2015). Attached as Exhibit 8. 12 Id. at v. Accord, Peter H. Howard, "The Bureau of Land Management's Modeling Choice for the Federal Coal Programmatic Review," Institute for Policy Integrity, (2016). Attached as Exhibit 9.	Phasing out federal leasing at the national level is beyond the scope of this SEIS, which is specific to the Miles City Field Office. The RFD forecast indicates that area mine operators have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the operators can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among the alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. An energy market model is not necessary to inform the management decision.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	In a 2018 paper published in Nature Climate Change, Peter Erickson and Michael Lazarus estimated a future reference case for U.S. coal, estimated the quantities of federal production that would be affected by a permanent leasing moratorium, and then modeled the market response to those production cuts through 2030. 14 Their analysis looked at market responses both with and without implementation of the Clean Power Plan. Employing the IPM, which includes all U.S. coal resources and power plants, the authors concluded: For coal, results from IPM indicate that, absent the Clean Power Plan, each EJ [exajoule] of coal no longer supplied (due to lease restrictions) to domestic power markets in 2030 would lead to substitution of 0.31 EJ from other coal supplies, especially from the Illinois Basin and Northern Appalachia. The net drop in national coal consumption would be 0.69 EJ for each EJ of federal coal not produced because of the lease restrictions. Gas consumption would also increase 0.35 EJ, to make up for the lost coal-based electricity. For coal export markets, we find that each EJ of US coal no longer exported to Asian power markets (e.g., South Korea and the Philippines) would yield a drop in net coal consumption of 0.30 EJ, accounting for partial substitution by other, higher cost sources of coal (e.g., from Indonesia and Australia). This ratio is within the range of results of global steam coal market modeling analysis, which found that each unit of coal not supplied to the Pacific coal market would lead to a reduction in coal consumption of between 0.1 and 0.4 units, depending on whether the supply market was less constrained (lower result) or more constrained (higher result) (Haftendorn et al. 2012). The higher price of coal would also lead to some switching to natural gas in Asian power markets (less so than in the U.S., given that gas is more costly and less available in Asia), amounting to an increase in natural gas consumption of 0.07 EJ for every EJ of US coal no longer exported due to the lease restrictions. In total, for coal, we find that leasing restrictions would reduce production by 5.4 EJ in 2030. The drop in CO2 emissions from the consumption of federal coal (largely from the Powder River Basin) in that year would be about 490 Mt CO2, as shown in Fig. 1b. Increased coal and gas supplies from	Phasing out federal leasing at the national level is beyond the scope of this SEIS, which is specific to the Miles City Field Office. The RFD forecast indicates that area mine operators have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the operators can acquire the rest. The RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among the alternatives. Furthermore, because new leases are not anticipated based on the RFD, there would not be any lease restrictions that would affect the domestic power market. An energy market model is not necessary to inform the management decision. This analysis is for the upper limits of GHG emissions as it accounts for the maximum production forecasted in the RFD. If the market were to contract, GHG emissions would be less than what is disclosed.

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(see above)	other sources would add back 162 Mt CO2 and 90 Mt CO2, respectively, resulting in a net overall reduction in emissions of 240 Mt CO2.15 14 Peter Erickson and Michael Lazarus, Would constraining US fossil fuel production affect global CO2 emissions? A case study of US leasing policy, Nature Climate Change (January 28, 2018), https://doi.org/10.1007/s10584-018-2152-z. Attached as Exhibit 11. 15 Id. at 8.	*(see above)*
Western Organization of Resource Councils, et al.	BLM relies on Elbakidze and Zaynutdinaova (2016) to support its conclusion that coal "has been found to be the most price inelastic energy source in the energy mix, as consumer demand does not respond drastically to changes in coal prices." Buffalo DSEIS at B-4; Miles City DSEIS at D-11. This conclusion is simply not found in the cited study. Rather, the unpublished paper relied on by BLM concluded that the opposite is generally true. According to Elbakidze and Zaynutdinaova, "Natural gas and coal act as substitutes, with positive cross price elasticities, in most of the states during both periods."16 That means that as the price of coal increases, utilities - the primary consumers of thermal coal produced in the Powder River Basin - respond by switching to a different fuel. The study goes on to note exceptions to that general rule, but it is inappropriate to draw the conclusion, as the EA has done, that the results show that utilities are unable to substitute natural gas for coal. Rather, the study confirms that such substitution is generally found. 16 Levan Elbakidze and Gulnara Zaynutdinaova, Substitution in electricity generation: A state level analysis of structural change from hydraulic fracturing technology, (2016), pg. 14. Attached as Exhibit 12.	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. As such, Elbakidze and Zaynutidinaova (2016) is no longer referenced in Appendix D. See Sections 3.2.1 and 3.2.2 and Appendix C.

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Western Organization of Resource Councils, et al.	BLM ignores that fact that its policies impact energy markets in predictable ways and that BLM has in fact studied these impacts in other NEPA reviews. For example, in its Final EIS for the Greater Mooses Tooth 2 offshore oil project, BLM used the Bureau of Ocean Energy Management's ("BOEM") Market Sim energy model to compare energy market substitution effects and different levels of GHG emissions of the No Action and Action Alternatives. As BLM explains in its methodology appendix to the EIS: To evaluate the difference between new OCS oil and gas leasing during the 2017-2022 Program and a No Action Alternative (i.e., no new leases in the 2017-2022 Program), BOEM uses information from EIA to estimate energy sources that would be used in absence of the 2017-2022 Program to meet energy demand. . . . Coal, biofuels, and nuclear and renewable energy sources are substituted for OCS oil and gas in lesser amounts. In addition, it is assumed that there would be some conservation measures, including reduced demand and consumption of all energy sources due to higher oil and gas prices in the absence of new OCS resource availability. … Changes in energy consumption patterns are estimated using BOEM's energy market simulation model, MarketSim (Industrial Economics, Inc. 2015)... This model simulates end-use domestic consumption of oil, natural gas, coal, and electricity in four sectors (residential, commercial, industrial, and transportation); primary energy production; and the transformation of primary energy into electricity. MarketSim mostly represents U.S. energy markets, but also captures interaction with world energy markets as appropriate. The model takes current measures of energy production, consumption, and prices assuming no new OCS leasing as a baseline to which a given scenario of OCS production is added.17 17 BLM, Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth 2 Development Project Final Supplemental Environmental Impact Statement, Vol. 3, App. H (unpaginated) (Aug. 2018), available at https://eplanning.blm.gov/epl-frontoffice/projects/nepa/65817/156375/191446/GMT2_Final_SEIS_Volume_3-_Appendicescompressed.pdf. Appendix H attached as Exhibit 13.	Decisions made in this RMPA would not result in shifts to the energy market. This is because the RFD does not anticipate new leasing beyond the approved leases or existing lease applications. Additionally, because this is an RMP-level supplement, the no-action alternative is the current Approved RMP (continued management); at the site-specific project level, a no leasing alternative would be analyzed. See Section 3.2.2 of the Final SEIS/Proposed RMPA.

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Western Organization of Resource Councils, et al.	The oil and gas industry is the nation's largest industrial source of methane pollution.18 The U.S. loses at least 1 to 3 percent of its total natural gas production each year when methane, a potent greenhouse gas, is leaked, flared (burned), or vented to the atmosphere during natural gas and oil production and distribution.19 In addition, a series of recent studies found that methane emissions from the oil and gas sectors are 60 percent greater than official U.S. government estimates.20 As BLM acknowledges, methane's lifetime in the atmosphere is much shorter than carbon dioxide (CO2), but methane is more efficient at trapping radiation than CO2.21 Thus, BLM must not understate the climate impact of methane emissions resulting from its approvals by using an outdated or incorrect estimate of methane's global warming potential ("GWP"). A GWP is a measure of the amount of warming caused by the emission of one ton of a particular greenhouse gas relative to one ton of carbon dioxide.22 For each greenhouse gas, a GWP has been calculated to reflect how long each gas remains in the atmosphere, on average, and how strongly it absorbs energy.23 The methane GWP estimates how many tons of carbon dioxide would need to be emitted to produce the same amount of global warming as a single ton of methane. This is important because methane is a much more potent greenhouse gas than carbon dioxide.24 Relative to carbon dioxide, methane has much greater climate impacts in the near term than the long term, and, therefore, also including a short-term measure of climate impacts would be most effective in considering policies to avoid significant global warming in the near-term. 18 Jayni Foley Hein, Federal Lands and Fossil Fuels: Maximizing Social Welfare in Federal Energy Leasing, 42 Harv. Envtl. L. Rev. 1, 19 (2018), (citing U.S. EPA, Overview of Greenhouse Gases, https://perma.cc/53W7-QRVY). Attached as Exhibit 14. 19 Id. (citing U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012 (2014), https://perma.cc/V9Y3-9K8V). Attached as Exhibit 15. 20 Ramón A. Alvarez et al., Assessment of methane emissions from the US oil and gas supply chain, 361 (6398) Science, (2018), 186-188. Attached as Exhibit 16. 21 U.S. EPA, Overview of Greenhouse Gases - Methane, https://perma.cc/53W7-QRVY. Attached as Exhibit 17. 22	GWPs are subject to significant uncertainties (+/- 30% and +/- 39% for the 20-year and 100-year methane GWP, per IPCC AR5, Table 8.SM.14). The BLM used GWPs for both 20- and 100-year time horizons for methane and N_2O, as listed in the International Panel on Climate Change Fifth Assessment Report (IPCC AR5) and published in Table 1-3 of the EPA's US Greenhouse Gas Emissions and Sinks inventory.

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(see above)	Gunnar Myhre and Drew Shindell et al., Anthropogenic and Natural Radiative Forcing in IPCC, Climate Change 2013: The Physical Science Basis, Contribution of Working Group 1 to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2013), 710-712, available at: http://www.climatechange2013.org/images/report/WG1AR5_Chapter08_FINAL.pdf. Attached as Exhibit 18. 23 Id.	*(see above)*
Western Organization of Resource Councils, et al.	While BLM disclosed GWPs for both the 20-year and 100-year time horizons from the IPCC's 2013/2014 Fifth Assessment Report (hereinafter, "AR5"), it failed to use the correct values for methane GWP from that report. Miles City DSEIS at 3-13; Buffalo DSEIS at 3-12. BLM cites a 100-year methane GWP of 28 and a 20-year methane GWP of 84. Miles City DSEIS at 3-13; Buffalo DSEIS at 3-12. AR5 includes a range of estimates for methane GWP.25 Without including climate-carbon feedbacks ("cc fb"), methane has a 100-year GWP ("GWP100") of 28 and a 20-year GWP ("GWP20") of 84. However, the IPCC also notes that, "[t]hese values do not include CO2 from methane oxidation. Values for fossil methane are higher by 1 and 2 for the 20 and 100 year metrics, respectively (Table 8.A.1) (emphasis added)."26 In other words, the most current lower-end scientific estimate of GWP100 for fossil methane, which is what will be produced from these BLM leases, is 30, not 28, and for GWP20 is 85, not 84. The IPCC also provides upper end estimates of fossil methane GWP100 and GWP 20 with cc fb of 36 and 87, respectively. BLM has provided no justification for why it relies on the incorrect, lower-end estimates of GWP100 and GWP20. These failures undermine the accuracy and integrity of the GWP analysis. See 40 C.F.R. §§ 1500.1(b), 1502.24. Thus, BLM failed to provide a "full and fair discussion" of the methane pollution resulting from its actions, as required by NEPA. See id. § 1502.1.	GWPs used in the SEIS are not necessarily lower bounds on the true values. This is because GWP values are subject to significant uncertainties (+/- 30% and +/- 39% for the 20-year and 100-year methane GWP as per IPCC AR5, Table 8.SM.14); thus, the true values may be lower than the values used. An increase of 1 in the 20-year methane GWP represents a change of 1% in the GWP value and an increase of 2 in the 100-year methane GWP represents a change of 7%. Both values are well within the methane GWP uncertainty bounds cited in AR5. Selection of GWPs for use in the EIS were based on consistency with GWPs used in the EPA's national GHG inventory and the global emission reported in AR5, neither of which included additional CO_2 from methane oxidation or climate-carbon feedbacks.

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Western Organization of Resource Councils, et al.	31 Numerous other analyses identify other actual environmental effects of climate change, including air quality mortality, extreme temperature mortality, lost labor productivity, harmful algal blooms, spread of west nile virus, damage to roads and other infrastructure, effects on urban drainage, damage to coastal property, electricity demand and supply effects, water supply and quality effects, inland flooding, lost winter recreation, effects on agriculture and fish, lost ecosystem services from coral reefs, and wildfires. See EPA, Multi-Model Framework for Quantitative Sectoral Impacts Analysis: A Technical Report for the Fourth National Climate Assessment (May 2017). Attached as Exhibit 22. 32 U.S. Global Change Research Program, Climate Science Special Report: Fourth National Climate Assessment, (2018). Attached as Exhibit 23. 33 U.S. EPA, Climate Change in the United States: Benefits of Global Action, (2015). Attached as Exhibit 24. 34 Union of Concerned Scientists, Underwater: Rising Seas, Chronic Floods, and the Implications for U.S. Coastal Real Estate, (2018). Attached at Exhibit 25.	Impacts in the Supplemental EIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference." Impacts from climate change on other resources are considered in the 2015 Proposed RMP/Final EIS.
Western Organization of Resource Councils, et al.	The tons of greenhouse gases emitted by the proposed actions are not the "actual environmental effects" under NEPA. Rather, the actual environmental effects are the climate impacts caused by those emissions, such as property loss, changes in energy demand, impacts to agriculture, forestry, and fisheries, human health impacts, changes in fresh water availability, ecosystem service impacts, impacts to outdoor recreation, and catastrophic impacts. These kinds of impacts are included in the social cost of carbon calculations developed by the Interagency Working Group.31323334	Impacts in the Supplemental EIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference." Regarding the social cost of carbon, Section E.3 below this table for a response.

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Institute for Policy Integrity, New York University School of Law	We also attach as supporting documents: (1) a report on modeling choices, (2) a report on the upstream externalities of PRB coal, (3) our amicus brief from a 10th Circuit case about energy substitution, (4) BOEM's 2015 description of MarketSim, and (5) EIA's 2018 updated Coal Market Module. Please note that due to copyright concerns, we are not able to attach every important source. We presume that BLM will have access to the various academic literature we cite, and have included full citations and URLs when available. We also presume that BLM has full access to other government documents that, due to the attachment file size limits, we have not included, such as BLM's own energy substitution analysis in the Greater Mooses Tooth 2 EIS, and the Surface Transportation Board's and FERC's energy substitution analyses in EISs.	This SEIS is specific to the Miles City Field Office. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	The Miles City DSEIS also incorporates by reference the entire fuel substitution analysis of the 2018 draft EA on for the Wright Area remand.36 However, that document was riddled with errors, as documented in Policy Integrity's comments on that draft EA, which are attached to this submission. Thus, even BLM's own citations do not support its claims about energy substitutions. Two of BLM's other arguments merit some additional discussion before turning to the important literature on energy substitution that BLM has ignored. First, the Miles City DSEIS touts that the coal from this region is some of the lowest-priced low-sulfur, sub-bituminous coal in the country.37 Nevertheless, BLM repeatedly assumes that if this coal were not leased, some other coal from the region or the country would perfectly substitute. However, BLM never analyzes whether, in such a scenario, the marginal cost of extraction and delivery would change, or the quality of the coal would change, with effects either on price and demand or on upstream and downstream emissions.	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. Additionally, the RFD scenario is specific to the MCFO. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives, thus no substitution of fuel sources is anticipated between the alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	Of the considerable literature on energy substitution analysis that BLM ignores, the most notable omission is the work on energy substitution that the Department of the Interior has relied on elsewhere. Specifically, the Bureau of Ocean Energy Management has developed a model, MarketSim, to study consumer surplus and energy substitutes for its oil and gas leases, by modeling not just oil and gas, but coal, nuclear, renewables, electricity imports, and electricity demand.39 For its assumptions of "long-run elasticities,"40 BOEM selected estimates from the literature based on methodological quality, data richness, and statistical significance.41 For its estimates of elasticity of coal, MarketSim uses Jones (2014), which studied long-run inter-fuel substitution among coal, oil, gas, electricity, and biomass using EIA data from 1960-2011.42 In the DSEISs, BLM never explains why it did not consult MarketSim or Jones (2014) for evidence of demand elasticities. Jones (2014) estimates both short-run and long-run elasticities, and finds that about 17% of the eventual substitution effect occurs in the first year, with 50% of the total substitution occurring by about the third year, and 90% of the total substitution occurring by the eleventh year;43 "long run elasticities are almost six times larger than their short run counterparts."44 In other words, the time horizon matters, and the total substitution effect increases with time. The long-run own-price elasticity for coal "is well above unity," meaning that consumers "can significantly reduce their coal usage and switch to one of the other three fuels when coal prices rise."45 Jones also finds that, even in the short run, coal can be substituted by both natural gas and electricity, as well as by oil, and in fact "the strongest channels of substitution are from coal to electricity, oil or natural gas."46	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. Additionally, the RFD scenario is specific to the MCFO. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives, thus no substitution of fuel sources is anticipated between the alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

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Institute for Policy Integrity, New York University School of Law	Other useful literature on energy substitution that BLM's draft EA does not mention includes: * Gerking and Hamilton (2008) finds that when rail transportation costs for Powder River Basin coal dropped, "Given the estimated price elasticity of demand for PRB coal of -3.79, this change in relative prices suggests that power plant operators substituted heavily in the favor of PRB coal and away from the use of other alternative fuels for the generation of electric power throughout the market area. This substitution could have occurred, for example, through utilization of coal mixtures tilted toward heavier use of PRB coal and using PRB coal-fired generating units more intensively. . . . [T]he decline in both the mine-mouth price of PRB coal together with the decline in railroad freight rates induced power plant operators to substitute PRB coal for high-sulfur coal as well as for other fuels because demand for PRB coal is price elastic."49 Conversely, therefore, if the marginal costs of PRB coal were to increase-for example, under an alternative action that involved less or no leasing-electricity suppliers might substitute "heavily" away from regional coal, either by using their coal-fired generators less intensively or by switching to coal substitutes with lower transportation costs and therefore lower upstream emissions. * Nate Blair et al. (2006) concludes that "higher coal prices would dramatically increase" use ofrenewable wind energy.50 * Lu et al. (2012) uses a regional econometric model and find that over half of the decrease in emissions from the power sector from 2008 to 2009 are attributed to reduction in relative gas price and the resulting switch away from coal-fired generation (with the rest of emissions reductions mostly due to the economic downturn).51 * Knittel et al. (2015) focuses on duel-fuel plants that burned both coal and gas at some point between 2003 and 2012, and finds that, due to "highly significant" fuel price coefficients, the drop in price of natural gas that occurred between June 2008 and the end of 2012 led to a 19% decrease in carbon dioxide emissions in investor-owned utilities in restructured markets, and a 33% reduction at investor-owned utilities in traditional electricity markets.52 * Linn et al., (2014) finds that higher coal prices cause a decrease in heat-rates as well as a significant effect on utilization.53 * Fell and Kaffine (2018) undertakes a	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. Additionally, the RFD scenario is specific to the MCFO. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives, thus no substitution of fuel sources is anticipated between the alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

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(see above)	"nuanced examination of the intensive margin response of coal-fired plants to changing relative fuel prices and wind generation," and finds that the joint impact of low natural gas prices and high wind generation levels is much larger than the independent impact of each on the reduction in coal-fired generation.54 This underscores the need for elasticity studies and substitution analyses to consider not just fossil fuel substitutes, but all energy substitute options together. *Collier & Venables (2014): "The key point is the existence of demand side substitutes for coal, in the form of oil, gas and renewables; the long run price elasticity of demand for a single fuel source (coal) is therefore likely to be high, even if the elasticity of demand for energy as a whole is low."55 * Works by Ko and Dahl (1998 and 2001), which BLM relied on in the 2018 draft EA for the Wright Area Remand, in fact support significant potential for substitution away from coal. The 2001 paper, for example, predicts "that the shifts from coal to gas will increase if restructuring results in more competition in electricity generation."56 This prediction could be important given the changes in the structure and competition of electricity markets since 1993, which was the year that Ko and Dahl's data came from.57 Ko and Dahl actually find a larger change in gas demand for a given change in coal price than other literature they review had found, and they find a larger elasticity in those utilities that burn only coal and gas versus in those utilities that burn coal, oil, and gas.58 Ultimately, Ko and Dahl find "fuel choice to show a considerable amount of price responsiveness."59 Ko and Dahl's work also has important limitations, including its age (it is based on 1993 data, which is before not just the shale gas boom, but also key changes in the electricity market's structure), its short-run estimates (it is based only on monthly data from 1993),60 and its focus on fossil fuels to the exclusion of renewables or changes in electricity demand. That said, neither Ko and Dahl's work nor its summary of the literature supports BLM's false conclusion that there would be no meaningful substitution away from coal under the no action alternative. 49 Shelby Gerking & Stephen Hamilton, What Explains the Increased Utilization of Powder River Basin Coal in Electric Power Generation?, 90 Am. J. Ag.	*(see above)*

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(see above)	Econ. 933, 948-49 (2008) (emphasis added). 50 Nate Blair et al., Long-Term National Impacts of State-Level Policies 8 (Nat'l Renewable Energy Lab. Conf. Paper 620-40105, June 2006), https://www.nrel.gov/docs/fy06osti/40105.pdf. 51 X. Lu, J. Salovaara & M.B. McElroy, Implications of the Recent Reductions in Natural Gas Prices for Emissions of CO2 from the US Power Sector, 46 Environmental Science & Technology 3014 (2012).. 52 Chris Knittel, K. Metaxoglou, and A. Trindade, Natural Gas Prices and Coal Displacement: Evidence from Electricity Markets, (MIT-CEEPR Working Papers, 2015- 013), http://ceepr.mit.edu/files/papers/2015-013.pdf. 53 J. Linn, E. Mastrangelo, and D. Burtraw, Regulating greenhouse gases from coal power plants under the Clean Air Act, 1 J. Ass'n Envtl. & Res. Econs. 97 (2014). 54 Harrison Fell & Daniel Kaffine, The Fall of Coal: Joint Impacts of Fuel Prices and Renewables on Generation and Emissions, 10 Am. Econ. J.: Econ. Pol'y 90 (2018). The above examples are illustrative of the other literature available on this subject. BLM should more thoroughly review the relevant literature. But the clear upshot from these examples and from the literature that BLM itself cites is that coal's own-price and cross-price elasticities in no way support BLM's conclusion that there will be effectively zero substitution away from coal under the various action alternative. Rather, the proposed actions under the Buffalo and Miles City plans will most likely change market prices in ways that increase total demand and total emissions.	*(see above)*

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	In 2016, the Institute for Policy Integrity submitted to BLM a detailed report on The Bureau of Land Management's Modeling Choice for the Federal Coal Programmatic Review.72 The report reviewed the suitability of NEMS, MarketSim, and IPM for analyzing, among other things, energy substitution effects. The report highlights the pros and cons of each model, but ultimately concludes that any model is likely a better choice than no model,73 that models like MarketSim can be modified to meet BLM's needs, and that all of the available models can generate at least some highly useful information to analyze BLM coal leases.74	This SEIS is specific to the MCFO. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.
Environmental Defense Fund, et al.	BLM Should Use the Interagency Working Group's 2016 Estimates of the Social Cost of Carbon and the Social Cost of MethaneIn 2016, the IWG published updated central estimates for the social cost of greenhouse gases: $50 per ton of carbon dioxide, $1440 per ton of methane, and $18,000 per ton of nitrous oxide (in 2017 dollars for year 2020 emissions)	Regarding the social cost of carbon, see Section E.3 below this table for a response.

Organization Name	Comment Text	Response Text
Air (including greenhouse gas emissions and climate change)		
Individual	The Miles City assessment does not … calculate the contribution of anticipated emissions to climate in neighboring and distant regions.	The emissions at the state and national level were considered (see Section 3.3.2). Impacts in the SEIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097) which states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference."
EPA Region 8	The greenhouse gas emissions (used as a surrogate for climate change impacts) were determined to be the same for all alternatives (page 3-23) based on the use of the same reasonably foreseeable development scenario. This contrasts with the information in the Coal Screening Process (Appendix A) which found that Alternative C would have less greenhouse gas emissions as a result of reduced transportation emissions to deliver coal to existing infrastructure (page A-6). We recommend adding this information to the climate change analysis and identify Alternative C as having slightly less greenhouse gas emissions.	Alternative C has 162,273 acres acceptable for further consideration for leasing; however, the RFD forecasts approximately 9,730 acres cumulatively, 5,649 acres of which are attributed to the mining of federal coal; therefore, since there are more acres acceptable for further consideration for leasing than what is forecast in the RFD, Alternative C still would not protect air resources by reducing GHG emissions. If the RFD had forecast additional acres over those acceptable for further consideration for leasing, the analysis would have shown that those acres above the 162,273 would not be made available, thereby reducing GHGs for those acres not made available.
Western Organization of Resource Councils, et al.	A Montana Farmers Union study from 2016 found climate change could cost Montana 26,000 farming and ranching jobs and more than $700 million over the next 50 years.2 Please see Exhibit 2 for further testimony from a qualified surface owner and rancher in the MCFO planning area about the impacts of climate change on agriculture.3 1 McKenna Dosier, "Flash floods damage farms and ranches," Miles City Star, July 12, 2019. Attached as Exhibit 1. 2 Lyndsay Bruno, "Montana Farmers Union Report: Climate Change Could Cost Montana Agriculture Industry almost 25,000 jobs and $726 million over the next 50 years," Montana Farmers Union, February 24, 2016. Attached as Exhibit 2. 3 Testimony of Mark Fix. Attached as Exhibit 3.	Agriculture can be primarily found within river bottoms and areas with alluvial valley floors. All perennial streams, 100-year floodplains, alluvial valley floors, wetlands, and riparian areas are determined unacceptable for further consideration for leasing, thereby affording protection to agricultural lands. We have considered GHG emissions as a proxy for climate change and considered this at the local, state, and national level. See Section 3.3.2. Compensation is set through federal regulations and state law and is outside the scope of this SEIS/RMPA.

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Western Organization of Resource Councils, et al.	Miles City DSEIS at Errata-3-8. This description provides even less information about the methodologies used than the Buffalo DSEIS and is completely inadequate to meet BLM's obligations under NEPA. In addition, by failing to include its various estimates of relevant inputs to the emissions calculations (e.g., emissions factors, emissions volumes, production volumes) in one single document, or at a minimum providing adequate citations including page numbers so commenters can readily locate these estimates amongst the various documents, BLM creates an undue burden on the public. Given the omissions and deficiencies described above, it is not possible for the public to independently determine how BLM arrived at its estimates of total GHG emissions or evaluate the adequacy of that analysis. BLM should not place the burden of analyzing data and drawing conclusions from it on the public. WildEarth Guardians v. Zinke, 368 F. Supp. 3d at 83. Even if it were possible for the public to analyze GHG emissions of agency decisions based on the data made available, it does not relieve BLM from its burden to consolidate the available data as part of its "informed decisionmaking," before taking action. Id. (citing WildEarth Guardians v. Jewell, 738 F.3d 298, 303 (D.C. Cir. 2013) (quoting New York v. Nuclear Regulatory Comm'n, 681 F.3d 471, 476 (D.C. Cir. 2012.))	Additional information on methods and inputs for emissions calculations are provided in Appendix B.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	BLM quantified GHG emissions for production and downstream combustion of oil, conventional natural gas, and coalbed natural gas, but not for transportation (Miles City DSEIS at 3-13; Buffalo DSEIS at 3-13), despite its acknowledgment that GHG emissions would result from transportation of oil and gas from the planning area by pipeline, rail, or tanker truck. Miles City DSEIS at 3-17; Buffalo DSEIS at 3-16. Instead, BLM only qualitatively discussed the GHG emissions from transportation of oil and gas from the planning area. Miles City DSEIS at 3-14; Buffalo DSEIS at 3-16. As justification for not quantifying these emissions, BLM claims that it, "does not have readily available data on how the transport of liquid and gaseous fossil fuels are distributed among the forms of transportation (pipeline, rail, and tanker truck), or the quantity distributed to each type, in order to quantify emissions that would be representative of actual or reasonably foreseeable future operations." BLM does not need exact data on the distribution among forms of transportation or quantity distributed to each type in order to quantitatively estimate emissions. BLM could have provided end-member emissions estimates for each transportation method by assuming all liquid and gaseous fuels would be transported by one method. While actual emissions will differ, this would at least provide the public with some sense of the potential scale of emissions. BLM failed to provide an explanation to support its decision not to quantitatively estimate the GHG emissions from activities other than production and downstream combustion, such as: potential emissions from gathering, boosting, processing, transmission, storage, distribution, and refining. Other indirect emissions sources downstream of the wellpad and upstream of end use that BLM should have disclosed and analyzed include, but are not limited to, CH4, CO2, and N2O emissions from: * Gathering and boosting stations; * Compressor stations; * Pig launchers/receivers; * Pipeline blowdowns; * Pipeline leaks; * Pneumatic devices; * Malfunctions and upsets; * Processing plants; and * Distribution pipeline and M&R station leaks. BLM acknowledges that combustion is not the only end use but fails to calculate potential emissions from those other end uses, stating, "[a]lthough the actual end use of these products also	The US District Court Order of March 2018 states that "BLM must supplement the Miles City FEIS and Buffalo FEIS with an analysis of the environmental consequences of downstream combustion of coal, oil, and gas open to development under each RMP". The BLM went beyond the court order in analyzing the environmental consequences of transporting coal, as the majority of Montana coal is transported by rail (EIA 2018)). Oil and gas transportation is more variable; transport methods, volumes, and destinations fluctuate. With this level of variability and unpredictability in oil and gas transport, quantifying estimated emissions would have a high degree of uncertainty and would not inform the decision-maker. Although the exact location and end use of each ton of produced coal is not known, the BLM has made a reasonable assumption that the produced coal evaluated in this EIS would be used to generate electricity. Consumption data from EIA shows that between 80 and 90% of all coal produced in the US is used for this purpose. Similarly, the BLM has reasonably assumed that all produced gas and oil will be combusted downstream, thus leading to reasonably conservative GHG emissions estimates. The BLM has then used emissions factors from the EPA for coal and oil and gas combustion to derive GHG emissions. While the BLM looked at field emissions from many of the other types of oil and gas sources, sufficient data are not available to reliably estimate midstream emissions. In addition, the court did not order a midstream emissions analysis; midstream emissions are speculative and highly dependent on field conditions and equipment and proximity to compressor stations and other processing facilities; they are typically negligible, in comparison with downstream combustion. Due to the uncertainty in quantifying these emissions, estimated midstream GHG emissions would not provide useful information for the decision-maker.

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(see above)	may include transportation fuels; feedstocks for plastics, chemical, and synthetic materials production; or other manufacturing, it is reasonably foreseeable to estimate emissions from combustion." Miles City DSEIS at Errata 3-12 - 3-13; Buffalo DSEIS at Errata 3-18. BLM failed to provide supporting justification for its omission of an analysis of these other end uses. BLM has not demonstrated that the other potential end-uses it recognizes result in lower GHG emissions than combustion. BLM should estimate GHG emissions based on anticipated end-use or at the very least provide a range of emissions estimates for various reasonable end-use scenarios. BLM includes only generic discussions of mitigation and the use of Best Management Practices (BMPs)." See, e.g., Miles City DSEIS at 3-55; Buffalo PRMP/FEIS at 1863. However, BLM fails to require the use of any of these BMPs to mitigate the impacts of GHG emissions and instead simply defers mitigation to some future unknown date. BLM also states that, "[m]ost recently (2012), EPA finalized regulations to reduce pollution from the oil and natural gas industry which is expected to result in substantial reductions in VOC emissions, air toxics, and CH4, an important GHG." Buffalo PRMP/FEIS at 324. However, EPA is currently in the process of weakening and rescinding its methane rules. In 2016, BLM also promulgated its own rules to limit methane emissions from oil and gas operations on federal and tribal lands - rules that have since been mostly repealed. As such, neither BLM's nor EPA's existing regulations are sufficient to prevent methane emissions from oil and gas development on federal and tribal lands. Therefore, BLM must analyze these emissions and include mandatory mitigation measures to address them.	Reliable data on other end uses and associated GHG emissions are not readily available or are highly speculative at the planning level of analysis. Assuming all of the product is combusted results in a reasonably conservative estimate of emissions. In addition, the court determined that the BLM considered methane mitigation measures within its authority under Claim 2 on page 47: "BLM has not violated NEPA by failing to consider an alternative at the RMP level that would mandate the type of methane mitigation measures proposed by Plaintiffs."
Western Organization of Resource Councils, et al.	29 Interagency Working Group on the Social Cost of Carbon, United States Government, Technical Support Document: Technical Update on the Social Cost of Carbon for Regulatory Impact Analysis-Under Executive Order 12866 (May 2013). Attached as Exhibit 20. 30 Interagency Working Group on the Social Cost of Carbon, United States Government, Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis-Under Executive Order 12866 (February 2010). Attached as Exhibit 21.	Regarding the social cost of carbon, Section E.3 below this table for a response.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	BLM failed to contextualize emissions, such as through the use of the social cost of carbon protocol, a valid, well-accepted, credible, and interagency-endorsed method of calculating the costs of greenhouse gas emissions and understanding the potential significance of such emissions.2930	Regarding the social cost of carbon, Section E.3 below this table for a response.
Western Organization of Resource Councils, et al.	The U.S. committed to the climate change target of holding the long-term global average temperature "to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels"35 under the Paris Agreement.36 The Agreement recognized the 1.5°C climate target because 2°C of warming is no longer considered a safe guardrail for avoiding catastrophic climate impacts and runaway climate change.37 Research that models emissions pathways for meeting 1.5° or 2°C targets shows that a rapid reduction in fossil fuel use in the United States is necessary. Specifically, research indicates that global fossil fuel CO2 emissions must reach net zero by mid-century and likely as early as 2045 for a reasonable likelihood of limiting warming to 1.5° or 2°C.38 The United States must achieve net zero fossil fuel CO2 emissions even earlier: between 2025 and 2030 on average for a reasonable chance of staying below 1.5°C, and between 2040 and 2045 on average for a reasonable chance of staying below 2°C.39 Halting new production and closing most existing oil and gas fields and coal mines before their reserves are fully extracted is one pathway to ending U.S. fossil fuel CO2 emissions between 2025 and 2030, consistent with the Paris climate targets. In light of rapidly shrinking global carbon budgets, BLM should consider a "no leasing" alternative. BLM has broad discretion not to lease public lands for minerals development, and has the responsibility to use this discretion to safeguard environmental and human health resources and values in light of climate change. See, e.g., Udall v. Tallman, 380 U.S. 1 (1965); Rocky Mountain Oil & Gas Ass'n v. U.S. Forest Serv. 157 F.Supp.2d 1142 (D. Mont. 2000). BLM should also use carbon budgeting to contextualize emissions, quantifying how much of the remaining global carbon budget the Buffalo and Miles City RMPs will consume, utilizing the plans' direct and indirect emissions. BLM recently took precisely this approach in a draft environmental assessment ("draft EA") for the New Elk coal lease in Colorado. This is a relatively simple	The BLM has included an analysis of cumulative GHG emissions from the production and combustion of coal open to development under the RMP. A carbon budget is based on the premise that there is a strong relationship between GHG emissions and future global temperature increases. Carbon budgeting is an approach for identifying how much additional CO_2 emissions the atmosphere can accept in order to limit global warming to a temperature increase above pre-industrial levels, such as 2.0° Celsius (C), as defined in the Paris Agreement, or 1.5°C, as used in many integrated climate assessment models. The carbon budget was developed as a tool to assist policy makers in reducing GHG emissions on national and global scales. The budget has evolved over time as scientists refine data and estimates of cumulative carbon emissions that have already occurred. For example, scientists recently revised the budget described in the IPCC Special Report to account for problems associated with the Earth System Models used in the IPCC Fifth Assessment Report budget estimates. These models underestimated historical cumulative CO_2 emissions and were projecting temperatures warmer than have been observed. According to the IPCC Special Report, "uncertainties in the size of these estimated remaining carbon budgets are substantial." The IPCC SR estimates the budget for a 50/50 chance of exceeding 1.5°C at 580 gigatons of CO_2 ($GtCO_2$), with an uncertainty of ±400GtCO2. This uncertainty is nearly 70% of the budget and results from the precise meaning of the 1.5°C target, the definitions of "surface temperature" and "pre-industrial" period, the choice in observational temperature datasets, the uncertainty in non-CO_2 factors that influence warming, and if earth-system feedbacks should be taken into account.

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(see above)	exercise, as BLM's New Elk draft EA demonstrates: The newest budget estimates are expressed as the remaining cumulative CO2 emissions from the start of 2018 until the time of net zero global emissions and suggest a value between approximately 420 gigatons of carbon dioxide (GtCO2) and 580 GtCO2. For the purposes of this analysis, an average of 500 GtCO2 is used (BLM 2019). Over the life of the project, the Mine is anticipated to generate 300.3 million tons of CO2e (direct and indirect) if all of the recoverable coal is mined under the Proposed Action. The federal scope or portion of that estimate would be 14.3 percent or 42.9 million tons of CO2e (Proposed Action minus the No Action Alternative). Although not strictly a one-to-one comparison, on a CO2e basis, the No Action Alternative would consume approximately 0.06 percent of the remaining carbon budget, while the federal scope of the Proposed Action Alternative would consume 0.01 percent.40 The fact that BLM has recently used this tool to analyze the climate impact of a single federal coal lease demonstrates the availability of the tool and BLM's ability to apply the tool in the NEPA decision making context. 35 United Nations Framework Convention on Climate Change, Conference of the Parties, Nov. 30-Dec. 11, 2015, Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9 (December 12, 2015), http://unfccc.int/resource/docs/2015/cop21/eng/l09.pdf ("Paris Agreement"). Attached as Exhibit 26. 36 On December 12, 2015, 197 nation-state and supra-national organization parties meeting in Paris at the 2015 United Nations Framework Convention on Climate Change Conference of the Parties consented to the Paris Agreement committing its parties to take action so as to avoid dangerous climate change. 37 Although President Trump announced on June 1, 2017 that the U.S. would withdraw from the Paris Agreement, the earliest possible effective withdrawal date is November 4, 2020, in accordance with Article 28 of the Agreement. 38 Joeri Rogelj et al., Energy system transformations for limiting end-of-century warming to below 1.5°C, 5 Nature Climate Change, (2015), 519. Attached as Exhibit 27. 39 See Climate Action Tracker, "USA," (last updated November 6, 2017), http://climateactiontracker.org/countries/usa, at rating figure showing U.S. emissions versus year (last visited November	With the large uncertainty in the remaining carbon budgets, it is not a useful tool for assigning a GHG emissions significance level at this time. Furthermore, the IPCC Special Report states that proposed actions across many sectors and spatial scales are needed to reduce emissions and limit warming. There is no requirement or mechanism to apply a worldwide carbon budget to a management plan in this EIS. Evaluations of such proposed actions are beyond the scope of this EIS. Based on the disclosed GHG emissions in the EIS and the substantial uncertainties in the size of carbon budgets, including carbon budgets would not provide additional useful information to the decision-maker or the public.

Organization Name	Comment Text	Response Text
(see above)	13, 2017). Attached as Exhibit 28. 40 BLM, New Elk Coal Lease By Application, Federal Coal Lease (COC71978), Draft Environmental Assessment, at 3-17 (April 2019). Attached as Exhibit 29.	*(see above)*
Spring Creek Mine	Page 3-16 talks about replacing coal-fired power plants with wind turbines. It is unclear where and how this relationship was developed.	Calculation methods are described in the documentation for the EPA's Equivalency Calculator cited in the SEIS (https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references). Additional information on methods and inputs for emissions calculations are provided in Appendix B.
Institute for Policy Integrity, New York University School of Law	In both the Buffalo and Miles City Draft Supplemental Environmental Impact Statements (DSEISs) on remand from Western Organization of Resource Councils v. BLM, the agency concludes that there will be no difference in actual greenhouse gas emissions under either plan, no matter which alternative action is selected.2 Even though the various alternatives do contemplate leasing different amounts of acreage, with different tons of recoverable coal and other resources,3 BLM applies the same Reasonably Foreseeable Development (RFD) scenario to all alternatives, rather than conducting an appropriate analysis of market demand based on prices and fuel substitution. BLM is wrong. Leasing these large tracts of low-cost coal reduces the marginal cost of coal production, which increases the quantity supplied and the quantity demanded for a given price, which increases the combustion and emissions from coal. The same market dynamics exist for oil and gas produced under these plans as well. BLM's assumption of perfect substitution relies on incomplete readings of the literature, on out-of-date data cherry-picked out of context, and on conclusions contradicted by its own analysis. It wrongly dismisses the potential for generation shifting, overlooks possible substitutions to renewable energy and demand reductions, and ignores effects on coal exports. BLM fails to actually model the energy substitution effects, relying instead on guesses, and the agency fails to analyze the full upstream and downstream consequences for emissions of the actual market outcomes. BLM also fails to recalculate the supposed economic benefits of leasing that the agency continues to touts-benefits that are overestimated for the same reason that the climate consequences are severely	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. This SEIS is specific to the MCFO. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives, thus no substitution of fuel sources is anticipated between the alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

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(see above)	underestimated in the DSEISs: because of overly simplistic and ultimately incorrect assumptions about substitution. BLM must fix all of these mistakes and omissions in its final SEISs on remand. A corrected final analysis will show that alternatives that lease more acreage for fossil fuel development will carry significant environmental consequences compared to alternative with less leasing, and that the alleged economic benefits of the leases are significantly diminished from its original analysis. Consequently, corrected final SEISs will show decisionmakers that the extent of resource development contemplated by these plans is a bad deal for the environment, for the U.S. government, and for the American people.	*(see above)*
Institute for Policy Integrity, New York University School of Law	Overall, BLM relies too heavily on simplifying assumptions about exports that do not reflect reality. Greenhouse gases are, of course, global pollutants that cause the same climate damages with the same impacts to U.S. interests regardless of where in the world they are emitted. BLM therefore needs to model the potential effects of leasing in this area based on global consumption of the fossil fuels produced under these plans.	Although the exact location and end use of each ton of produced coal is not known, the BLM has made a reasonable assumption that the produced coal evaluated in this EIS would be used to generate electricity. Consumption data from EIA shows that between 80 and 90% of all coal produced in the US is used for this purpose, and greater than 90% of coal produced in Montana is used for electricity generation. Similarly, the BLM has used reasonably conservative GHG emission factors from the EPA for natural gas combustion and combustion of oil for residential heating in the US. Also, as the reviewer has noted, greenhouse gases are global pollutants, so the BLM accounted for all GHG emissions from combustion of the coal, gas and oil open to development under the RMP. For this analysis, the agency assumed that these commodities are 100% combusted and that all of this combustion occurs in the US.

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Institute for Policy Integrity, New York University School of Law	Even if modeling were somehow truly too exorbitant and infeasible (and again, it is not), it still would not follow that BLM's perfect substitution assumption would be the best default position. Instead, a no substitution assumption would at least provide a useful upper-bound estimate of greenhouse gas emissions and would be consistent with how BLM currently calculates economic benefits (see below). The Federal Energy Regulatory Commission, for example, has used both gross downstream emission estimates and "full burn" estimates in its environmental impact statements to supplement its rough attempts to estimate net post-substitution downstream emissions.75 By comparison, perfect substitution provides no useful environmental information under NEPA and, as the Tenth Circuit ruled, contradicts basic principles of supply and demand. Again, BLM's best option is to model the energy substitution effects. Only if modeling is truly too exorbitant and infeasible should BLM then apply a default assumption of no substitution.	This SEIS is specific to the MCFO. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	Even to the extent one source of coal can substitute for another source of coal, the greenhouse gas consequences are not necessarily identical. BLM fails to assess the upstream or downstream consequences of coal-coal substitutions, and instead assumes with no explanation that the relative greenhouse gas emissions would be identical across alternatives. In terms of downstream emissions, over 99% of the coal in the area is sub-bituminous, and BLM uses the emissions factors for sub-bituminous coal to calculate downstream emissions.76 But according to EPA's greenhouse gas emission factors for various types of coal, sub-bituminous coal generally emits slightly more carbon dioxide per Btu than the average mixture of coal combusted in the U.S. electric power sector (97.17 kg CO2 per mmBtu for sub-bituminous, versus 95.52 kg CO2 per mmBtu for mixed electric power sector coal).77 Therefore, if sources of coal outside the planning areas substituted for these tracts, total downstream greenhouse gas emissions per mmBtu could decrease. BLM has failed to analyze whether this difference is significant.	This SEIS is specific to the MCFO. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	Similarly, upstream emissions and other upstream externalities can differ depending on the source of coal. Besides methane emitted from the coal extraction process, a major source of upstream emissions from coal mining is the transportation of coal from the mine to the consumer. Travel distances for coal from the Powder River Basin, for example, are longer than the average travel distance for coal in the United States, and travel costs increase with distance travel.78 For example, per metric ton of Wyoming coal mined, the externality costs of greenhouse gas emissions from train transport are nearly twice as high as the externality costs from mine methane-and that does not even count all the other externalities from coal transport, including fatalities from train accidents, health and environmental effects from other air pollution, and congestion and noise from trains.79 Under various alternatives to leasing in these areas, substitute sources of coal will have different-and could have significantly fewer-climate consequences and other externalities. BLM has failed to analyze whether these upstream differences are significant.	The BLM analyzed emissions from transporting coal by train, using data from the Energy Information Agency and average transport distances. Impacts in the SEIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference."
Environmental Defense Fund, et al.	In the draft supplemental EISs (DSEISs) on remand, BLM now continues to decline to use the social cost of greenhouse gases. The Miles City DSEIS does not mention the social cost of greenhouse gases at all.6 The Buffalo DSEIS presents spurious arguments in Appendix D on why it need not use the metrics.7	Regarding the social cost of carbon, Section E.3 below this table for a response.

Organization Name	Comment Text	Response Text
Environmental Defense Fund, et al.	In both DSEISs, BLM has failed to adequately analyze and disclose information about the plans' actual environmental consequences, including the significance of the plans' resulting greenhouse gas emissions and contributions to climate change.	The BLM analyzed emissions from transporting coal by train, using data from the Energy Information Agency and average transport distances. Impacts in the SEIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference."
Environmental Defense Fund, et al.	in these DSEISs, BLM continues to fail to disclose the significance of the plans' climate effects, and inconsistently selects which effects it wants to contextualize in terms of money (economic effects) and which it does not (climate effects)	Regarding the social cost of carbon, Section E.3 below this table for a response.
Environmental Defense Fund, et al.	Despite the District of Montana's ruling, the DSEISs' analyses of the plans' impacts on climate change remain inadequate.	The BLM analyzed emissions from transporting coal by train, using data from the Energy Information Agency and average transport distances. Impacts in the SEIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference."

Organization Name	Comment Text	Response Text
Environmental Defense Fund, et al.	A proper quantification of emissions would reveal significant differences in net emissions between the alternatives under consideration, and monetization of those different emissions would reveal the significance of the climate impacts resulting from BLM's choices made in these plans.	This SEIS is specific to the MCFO. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C. Regarding the social cost of carbon, Section E.3 below this table for a response.

Organization Name	Comment Text	Response Text
Environmental Defense Fund, et al.	by only quantifying the volume of greenhouse gas emissions, agencies fail to assess and disclose the actual climate consequences of an action and misleadingly present information in ways that will cause decisionmakers and the public to overlook important climate consequences.	The BLM analyzed emissions from transporting coal by train, using data from the Energy Information Agency and average transport distances. Impacts in the SEIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference."
Environmental Defense Fund, et al.	BLM Must Assess Actual Incremental Climate Impacts, Not Just the Volume of Emissions The tons of greenhouse gases emitted by a project are not the "actual environmental effects" under NEPA. Rather, the actual effects and relevant factors are the incremental climate impacts caused by those emissions, including:25 * property lost or damaged by sea-level rise, coastal storms, flooding, and other extreme weather events, as well as the cost of protecting vulnerable property and the cost of resettlement following property losses; * changes in energy demand, from temperature-related changes to the demand for cooling and heating; * lost productivity and other impacts to agriculture, forestry, and fisheries, due to alterations in temperature, precipitation, CO2 fertilization, and other climate effects; * human health impacts, including cardiovascular and respiratory mortality from heat-related illnesses, changing disease vectors like malaria and dengue fever, increased diarrhea, and changes in associated pollution; * changes in fresh water availability; * ecosystem service impacts; * impacts to outdoor recreation and other non-market amenities; and * catastrophic impacts, including potentially rapid sea-level rise, damages at very high temperatures, or unknown events.26	The BLM analyzed emissions from transporting coal by train, using data from the Energy Information Agency and average transport distances. Impacts in the SEIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference." Regarding the social cost of carbon, see section E.3 below this table which provides a response.

Organization Name	Comment Text	Response Text
Environmental Defense Fund, et al.	25 These impacts are all included to some degree in the three integrated assessment models (IAMs) used by the IWG (namely, the DICE, FUND, and PAGE models), though some impacts are modeled incompletely, and many other important damage categories are currently omitted from these IAMs. Compare Interagency Working Group on the Social Cost of Carbon, Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis at 6-8, 29-33 (2010), https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf [hereinafter 2010 TSD]; with Peter Howard, Omitted Damages: What's Missing from the Social Cost of Carbon (Cost of Carbon Project Report, 2014), http://costofcarbon.org/files/Omitted_Damages_Whats_Missing_From_the_Social_Cost_of_Carbon.pdf. For other lists of actual climate effects, including air quality mortality, extreme temperature mortality, lost labor productivity, harmful algal blooms, spread of west nile virus, damage to roads and other infrastructure, effects on urban drainage, damage to coastal property, electricity demand and supply effects, water supply and quality effects, inland flooding, lost winter recreation, effects on agriculture and fish, lost ecosystem services from coral reefs, and wildfires, see EPA, Multi-Model Framework for Quantitative Sectoral Impacts Analysis: A Technical Report for the Fourth National Climate Assessment (2017); U.S. Global Change Research Program, Climate Science Special Report: Fourth National Climate Assessment (2017); EPA, Climate Change in the United States: Benefits of Global Action (2015); Union of Concerned Scientists, Underwater: Rising Seas, Chronic Floods, and the Implications for U.S. Coastal Real Estate (2018). 26 2018 Intergovernmental Panel on Climate Change, Summary for Policymakers, in Global Warming of 1.5°C: An IPCC Special Report on the Impacts of Global Warming of 1.5°C Above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty 11 (Valérie Masson-Delmotte et al.	Regarding the social cost of carbon, Section E.3 see the section below this table for a response.

Organization Name	Comment Text	Response Text
(see above)	eds., 2018), available at: https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_version_stand_alone_LR.pdf [hereinafter, Summary of IPCC 1.5°C Report]	*(see above)*
Environmental Defense Fund, et al.	The Miles City DSEIS briefly mentions changes in temperature, sea level, and precipitation and alludes to effects on "natural and human systems," and refers back to its original description of climate change from 2015,27 but nowhere refers even qualitatively, let alone quantitatively, to the plan's actual contributions to concrete climate effects like property loss, agricultural productivity, or human health.	The BLM analyzed emissions from transporting coal by train, using data from the Energy Information Agency and average transport distances. Impacts in the SEIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference." Finally, the impacts of climate change on other resources are considered in the 2015 Proposed RMP/Final EIS.
Environmental Defense Fund, et al.	As a result, focusing just on the volume or rate of emissions, as BLM does here, is insufficient to reveal the incremental effect on the climate.	The BLM analyzed emissions from transporting coal by train, using data from the Energy Information Agency and average transport distances. Impacts in the SEIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference."

Organization Name	Comment Text	Response Text
Environmental Defense Fund, et al.	BLM's comparison here of the plans' annual emissions to either national or global emissions (e.g., annual emissions from Buffalo coal development and combustion are 0.77% of global emissions;37 annual emissions from Miles City coal are 0.62% of national emissions38) misleadingly suggests that the project's contribution to climate change is static and small, while in fact a continuing stream of about 400 million metric tons per year in emissions will inflict marginally increasing damage each year as background concentrations rise. Comparing the plans' emissions to a state, national, or global inventory reveals nothing about the significance of the project's contributions to actual environmental impacts.	The BLM analyzed emissions from transporting coal by train, using data from the Energy Information Agency and average transport distances. Impacts in the SEIS were evaluated in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects." In addition, the use of GHG emissions to evaluate climate change impacts was upheld in the court's opinion and order, as stated under Claim 4, page 47, "BLM's selection of GHG emissions as a proxy by which to analyze climate change impacts represents a scientific judgment deserving of deference."
Environmental Defense Fund, et al.	Characterizing an annual contribution of nearly 400 million metric tons of carbon dioxide equivalent on average per year from coal production and combustion as just 0.77% of global emissions misleadingly makes the climate impacts appear vanishingly small. By comparison, by applying the social cost of carbon dioxide (about $51 per ton for year 2020 emissions in 2017$46), decisionmakers and the public can readily comprehend that 403 million tons of carbon dioxide emitted just in the year 202047 will generate over $20 billion in climate damages in that year alone.48	Regarding the social cost of carbon, Section E.3 below this table for a response.

Organization Name	Comment Text	Response Text
	Cumulative Impacts	
Western Organization of Resource Councils, et al.	In order to understand the environmental consequences of BLM's plans, the public and the agency must first understand how BLM's decision to allow massive amounts of coal, oil, and gas production in the planning areas impacts overall production and use of coal, oil, and gas. BLM has the tools that would allow it to study the issue and disclose the market and climate impacts to the public and decisionmakers - other federal agencies have used these market models for years - but BLM has failed to either use the tool or explain its refusal to do so in the SDEISs.	This SEIS is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	In particular, BLM must evaluate the potential energy models - and ultimately use one or more of these models - in order to adequately analyze how various alternatives would affect coal supply, coal combustion, and greenhouse gas emissions.	This SEIS is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C. Regarding the social cost of carbon, see section below this table that provides a response.
Western Organization of Resource Councils, et al.	Here, BLM cannot isolate the climate impacts of the Buffalo Plan from the Miles City Plan, and vice versa. BLM approved both plan amendments in a single Record of Decision. It is now reviewing both plans along identical public comment timelines. Together, the plans cover one geologic region known as the Powder River Basin. BLM cannot ignore the combined climate impact of these two plans, as they are clearly reasonably foreseeable under 40 C.F.R. § 1508.7. As in the Keystone XL case, leaving out the massive climate impacts of the Buffalo plan from the Miles City DSEIS (and the Miles City plan from the Buffalo DSEIS) leaves out significant information from the climate analysis that is in BLM's possession.	Buffalo Field Office emissions have now been added as a cumulative source. See revised Chapter 3 in the Final SEIS/Proposed RMPA.

Organization Name	Comment Text	Response Text
Environmental Defense Fund, et al.	Some of the incremental impacts on the environment that the social cost of greenhouse gas protocol captures-and which the DSEISs fails to meaningfully analyze-include property lost or damaged; impacts to agriculture, forestry, and fisheries; impacts to human health; changes in fresh water availability; ecosystem service impacts; impacts to outdoor recreation and other non-market amenities; and some catastrophic impacts, including potentially rapid sea-level rise, damages at very high temperatures, or unknown events	Regarding the social cost of carbon, Section E.3 below this table for a response.
Coal Screens		
Montana Fish, Wildlife & Parks	Figures A-1 We have serious concerns regarding the potential for industrial development in close proximity to two state parks - Rosebud Battlefield and Tongue River Reservoir State Parks. These parks contain irreplaceable natural, cultural, and recreational resources that must be considered as any plans develop.	Rosebud Battlefield National Historic Landmark (unsuitability criterion 7), along with its associated viewshed (multiple-use consideration) and Tongue River Reservoir State Park with a 300-foot buffer (unsuitability criterion 3) are unacceptable for further consideration for coal leasing. See Appendix A for more information.
Montana Fish, Wildlife & Parks	Rosebud Battlefield State Park is also a National Historic Landmark, and is subject to provisions found in the Department of Interior's regulations. Per Title 36 CFR 65, planning activities and evaluation must be in alignment with the National Park Service's National Historic Landmark Program. FWP's heritage program manager also would need to be consulted for any industrial development activities that are planned near this park.	Rosebud Battlefield National Historic Landmark (unsuitability criterion 7), along with its associated viewshed (multiple-use consideration), are unacceptable for further consideration for coal leasing. See Appendix A for more information. The viewshed was modeled in GIS, while taking into consideration the landscape at existing interpretive points out to 20 miles. This viewshed identifies visible locations from these points to be able to protect the cultural values or settings.

Organization Name	Comment Text	Response Text
Montana Fish, Wildlife & Parks	SEE ATTACHMENT FOR SCREEN 1 COAL DEVELOPMENT POTENTIAL MAP FROM THE EIS WITH LABELS FOR TONGUE RIVER RESERVIOR STATE PARK AND ROSEBUD BATTLEFIELD STATE PARK. We are concerned about the potential negative impacts that additional industrial development activities are likely to have on visitor experience to these parks. The potential for added noise, traffic, damage to natural resources, and other disruptions resulting from development activities could negatively impact visitors to these state parks. We request that areas near these parks be removed from consideration for proposed development activity, as any attempt to extract mineral resources beyond what is currently occurring has the potential for serious negative effects on these important public resources, and the public's ability to enjoy them.	Rosebud Battlefield National Historic Landmark (unsuitability criterion 7), along with its associated viewshed (multiple-use consideration) are unacceptable for further consideration for coal leasing. See Appendix A for more information. The viewshed was modeled in GIS while taking into consideration the landscape at existing interpretive points out to 20 miles. This viewshed area identifies visible locations from these points to be able to protect the cultural values or settings. The Tongue River Reservoir State Park is determined unsuitable under criterion #3 with a 300-foot buffer around the park. See Appendix A for more information.
Montana Fish, Wildlife & Parks	Figures A-8 and A-11 Please update the map to reflect the current distribution and spawning migrations for adult pallid sturgeon; also incorporate use by juvenile pallid sturgeon. Please see the attached map found in the draft pallid sturgeon management plan. (SEE ATTACHMENT IN LETTER #13).	The BLM considered essential habitat for pallid sturgeon. Maps in the SEIS reflect the pallid sturgeon habitat in the area of federal coal potential with federal jurisdiction.
Western Organization of Resource Councils, et al.	Third, BLM claims that it is powerless to consider reducing coal leasing on the public lands BLM manages to help prevent climate change because the coal screening process does not include climate change in the list of considerations for whether to list coal resources "unsuitable" for development. In Miles City, BLM stated that its coal screening criteria, set out at 43 C.F.R. § 3420.1-4e "are clear in their direction that coal unsuitability is based on protecting specific, high-value resources and does not balance unspecific resource concerns." Miles City DSEIS at 2-7. In Buffalo, BLM stated that it "is required to go through the coal screening process outlined in 43 CFR 3420 et. seq. versus applying a blanket no leasing alternative. During this coal screening process, BLM analyzed all relevant resources when considering what areas to make acceptable for further consideration for coal leasing." Buffalo DSEIS at 2-7. Although BLM went through the coal screening process, the coal screening criteria do not include climate change.	The unsuitability criteria at 43 CFR 3461.5 do not have a criterion for climate change; however, the MCFO did consider climate change in the multiple-use criterion under 43 CFR 3420.1-4. The BLM has updated Section 2.2.6 to better explain that any new leases beyond what was considered in the RFD would be outside the scope of impacts analyzed in this SEIS and would result in additional NEPA analyses. For additional information on the coal screening process, see Section 1.5.2, 2.2.1, and Appendix A.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	On Figure 3-1, "Alternative B: Impact Analysis Area," it appears that the federal coal beneath the Bones Brothers Ranch southeast of Birney, Mont., on Hanging Woman Creek has been deemed acceptable for leasing under Alternative B. The Bones Brothers Ranch is listed on the National Register of Historic Places and falls under the definition of Historic lands under 43 CFR §3641.5(g). Federal coal beneath the ranch should be removed from acceptability for leasing under Alternative B.	Criterion 7 for the National Register of Historic Places, includes the Bones Brothers Ranch; however, the regulations include an exception for this criterion, which is described at 43 CFR 3461.5(g)(2).
Spring Creek Mine	Figure A-13 shows a water shed on lands south and west of the SCC mine permit boundary as shown below. SCC maps and baseline studies do not show municipal watersheds in this area.(See attachment for Figure A-13)	Water wells are listed as a municipal water supply by the State of Montana. Data were obtained from the State.
Spring Creek Mine	Figure A-14 appears to show all ephemeral drainages as Alluvial Valley Floors (AVF) within and near the mine permit boundary in blue below. SCC has conducted extensive AVF studies in these areas and submitted the information to the MDEQ for permit applications. It does not appear this information was considered when Figure A-14 was developed.(See attachment for Figure A-14)4. Similarly, Figure A-15 shows areas designated as unsuitable without exception in pink below. These appear to be the same AVF areas shown in A-14. Many of them were studied and determined not to be classified as an AVF. The MDEQ or SCC can provide a copy of these studies.(See attachment for Figure A-15)	The BLM used the most current data available. It used quaternary alluvial geological units to determine alluvial valley floors, which typically coincide with perennial streams. This landscape-level approach ensured that all possible alluvial valley floors were included in the coal screening process. Montana DEQ provided limited alluvial valley floor determinations, but the data were not in a format that could be used by the BLM in GIS. Unsuitability criterion 19 does not differ in alluvial valley floor significance. The BLM used Montana DEQ 2017 alluvial valley floor report for Squirrel Creek; however, Montana DEQ did not determine significance in the report, so Squirrel Creek was identified as an alluvial valley floor under this criterion.

Organization Name	Comment Text	Response Text
	Direct/Indirect Impacts	
Western Organization of Resource Councils, et al.	In considering a No Leasing alternative, BLM must account for the different market impacts of its considered alternatives in order to understand and compare greenhouse gas emissions across alternatives. This information is essential to understand the climate impacts of the plans, which is the entire point of considering different levels of fossil fuel production.	This SEIS is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	Third, although BLM refuses to study the market effects of any alternative, it "assumes" that its decisions - across the entire Powder River Basin and all federal lands - have no impact on the amount of coal developed. Buffalo DSEIS at 3-25; Miles City DSEIS at 3-48. This final point is plainly inaccurate and has been rejected by several courts.	This SEIS is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.
Environmental Defense Fund, et al.	Despite BLM's attempts to use terminology to distinguish the impacts it wants to monetize from those impacts it would prefer not to monetize, NEPA regulations group all these impacts under the same category of "effects": economic and social impacts are listed as "effects" alongside ecological and health impacts, and all these effects must be discussed in as much detail as possible in an adequate NEPA review.78 Whether an effect is a cost, benefit, or transfer, if monetization is the best way to assess that effect's significance and contextualize the precise impacts, then monetization is the best way to comply with NEPA's obligations.	Regarding the social cost of carbon, Section E.3 below this table for a response.
Economics		
Montana Fish, Wildlife & Parks	Page 3-27 Add Powder River to the 3rd sentence of the 4th paragraph.	Change made.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	BLM tries to argue that, among fossil fuels, coal is "the most price inelastic with respect to demand," and that coal-reliant states have limited ability to switch away from coal.6 BLM relies principally on two sources to support these claims: Gao et al. 2013, and Elbakidze & Zaynutidnova 2016. Not only are both those studies limited in important ways, but overall those studies do not support BLM's claims. Indeed, BLM even contradicts itself, citing the same sources for the proposition that "natural gas was easily substituted for coal in all U.S. states from 2009 through 2014."7 BLM also concedes that "recent price trends have led to the decline of coal use and increase of natural gas use," and that there are "increasingly positive elasticity of substitution between natural gas and coal."8 BLM also admits that coal could be easily substituted with renewable energy sources, but claims such dynamics are too "difficult to predict."9 In fact, substitution between coal and renewables like solar, onshore wind, offshore wind, hydropower, and biofuels-as well as substitution to nuclear, substitution to imported electricity, effects on exports, effects on technological improvements like heat rate, and effects on reduced demand for coal and for overall electricity-are hallmarks of a proper energy substitution analysis. BLM well knows this, from having recently used the MarketSim model to conduct an energy substitution analysis for the Greater Mooses Tooth 2 (GMT2) Development Project.10 BLM's statements both within these DSEISs and in other documents like the GMT2 EIS contradict its assumptions that the Buffalo and Miles City plans can have no effect on the overall supply, price, or demand for fossil fuels. Rather, these dynamics can all be modeled, and should be modeled here.	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. Additionally, the RFD is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives, thus no substitution of fuel sources is anticipated between the alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	Not only does Gao et al. show cross-elasticities between coal and other fuels, but the results do not even support BLM's claim that coal is always the most own-price inelastic fossil fuel. In Table 4, showing static Marshallian unconditional price elasticities, Gao et al. find that, in the PJM and the Midwest regions, coal is more own-price elasticit than gas; and in Table 6, for dynamic Marshallian fuel price unconditional elasticities, Gao et al. find that coal in the Midwest is also more own-price elastic than gas.13	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. As such, discussions related to fuel elasticities are no longer referenced in Appendix D. Additionally, the RFD is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. The RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels across the alternatives, thus no substitution of fuel sources is anticipated between the alternatives**.** Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	Elbakidze and Zaynutdinaova also has important limitations, as well as conclusions that contradict BLM's assumptions. First, the overall quality of this presentation paper-which was selected for the Agricultural & Applied Economics Association meeting but has not undergone full peer review-calls into doubt some of its conclusions.14 Though writing quality is certainly not determinative of the quality of the underlying economic analysis, some of the typographical errors in this work are so severe-such as spelling Rhode Island as "Road Island"15-that the writing quality does raise questions about what else may be wrong and whether there are other mistakes in the analysis that a peer review publication process would uncover. Putting those concerns aside, much of the paper goes against BLM's conclusions. The paper begins with the understanding that the electric power sector has "the ability . . . to respond to changes in . . . relative fuel prices."16 The paper summarizes the past literature as finding that "natural gas was a substitute input for coal . . . to various degrees across the seven electricity generation regions in the US,"17 and as showing that coal consumption can increase due to "factors like decrease in railroad freight rates and power plants' elastic demand for coal."18 The paper notes that the decline in coal consumption since 2008 is "not surprising" given changes in relative costs of coal to gas.19 As for the paper's own results, except for in three states (Iowa, Nebraska, and New Hampshire), the paper finds that "natural gas and coal appear to be substitutes in all states across all three sample periods."20 The paper also has some of the same limitations as Gao et al. For example, it specifically "defer[s] examination of . . . renewable sources."21	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. As such, discussions related to fuel elasticities are no longer referenced in Appendix D. Additionally, the RFD is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. The RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels across the alternatives, thus no substitution of fuel sources is anticipated between the alternatives. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	BLM also cites a 2008 study by the U.S. Government Accountability Office (GAO) for the idea that "transitioning power plants to alternative fuel sources are unlikely, due to the economic and infrastructural challenges faced (GAO 2008)."22 BLM seems to have in mind converting individual power plants from coal to instead burn other types of fuel. Such retrofits are indeed sometimes technologically complicated, but that is precisely why the GAO study identified generation shifting by reprioritizing the dispatching of electricity generators as a much more efficient and preferred option.23 Additionally, the GAO's conclusions from 2008 turned on assumptions about "high natural gas prices,"24 which no longer hold true after the shale gas boom lowered gas's price. Overall, BLM misses the most relevant point from the 2008 GAO report (about dispatch priority), and so the agency is far too quick to dismiss the potential for generation shifting away from coal to other fuels, like gas or renewables.	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. As such, BLM is aware of the complexities involved in dispatch order of different power plant units and fuel types as was discussed in the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. The RFD is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. The RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels across the alternatives thus no substitution of fuel sources is anticipated between the alternatives. See Sections 3.2.1 and 3.2.2 and Appendix C.
Institute for Policy Integrity, New York University School of Law	BLM also cites to several U.S. Energy Information Administration documents, but continues to cherrypick the points that suit it. The executive summary of EIA's 2012 report on Fuel Competition in Power Generation and Elasticities of Substitution paints a much different and much rosier picture of coal-to-gas substitution than the one BLM presents: [A] sudden increase in spot prices for Appalachian coal during 2008 has been followed by a sustained decline in the delivered cost of natural gas, both of which have substantially shifted the dispatch pattern for baseload generation in some parts of the country, favoring natural gasfired united over coal-fired units. . . . The model results indicate that for the United States as a whole, a 10-percent increase in the ratio of the delivered fuel price of coal to the delivered price of natural gas leads to a 1.4-percent increase in the use of natural gas relative to coal.25 In short, the fact that EIA found some degree of inelasticity of demand does not mean that there will be no substitution from coal to other energy sources; perfect elasticity is not required for some significant substitution to occur. Furthermore, contrary to BLM's conclusion that coal is the most own-price inelastic of the fossil fuels, EIA shows that own-price elasticities vary by region of the country, and "in some regions coal is more responsive to	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. As such, discussions related to fuel elasticities are no longer referenced in Appendix D. Additionally, the RFD is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. The RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels across the alternatives, thus no substitution of fuel sources is anticipated between the alternatives. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
(see above)	price than natural gas."26 Even if BLM's gloomier read of the 2012 EIA study were correct (and it is not), there are several important limitations of the 2012 EIA study.27 The report looks only at "competition between coal, natural gas and petroleum,"28 and not other energy substitute options. In fact, while EIA's model assumes that the price of "nuclear, hydropower, and other renewable energy sources" will "have minimal impact on generators' choice of fossil fuel,"29 the report readily acknowledges, for example, that "the availability of hydropower in any given year can have a tremendous impact on the mix of fuels" in the western U.S. region.30 The report draws only on data through the year 2010,31 when relative fuel prices were just beginning to change. The report focuses on a relatively shorter-run period of just six years, from 2005 to 2010.32 Because "the capacity mix" in the data "did not vary much during the sample period," the model ran into difficulties with its "attempt[] to account for changes in capacity over the long-run."33 The report explicitly says that it is "present[ing] the short-run estimates of regional cross price elasticities of substitution between coal, natural gas, and oil."34 Over a longer period of time, even greater substitution effects would be likely. If a longer-run study, based on more recent data and accounting for renewable energy, were run today, the results could be very different. Yet to repeat: even with all its limitations, the conclusions of the 2012 EIA report in no way support BLM's assumption that there will be no meaningful substitution away from coal under the no action alternative.	*(see above)*

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	BLM's citations to EIA's 2019 Annual Energy Outlook are also misleading, because BLM focuses solely on the single scenario presented in the reference case. But by comparing EIA's different cases, it becomes clear that by changing assumptions or conditions for the supply and price of various fossil fuels, demand changes as well. For example, in the high oil and gas resource and technology case, the relative price of coal increases relative to other fuels as compared to the reference case. With such a change in relative prices, EIA finds that coal-fired retirements accelerate and coal demand drops, by as much as 30% in some regions.35 A change in the supply of coal, by changing the conditions of federal leases, could have a similar kind of effect on relative fuel prices, with a similar kind of effect on demand. BLM ignores such data.	Future federal coal development in the MCFO depends on the level of future coal demand, both domestic and international, which is expected to be fulfilled from federal coal deposits. Many market and societal forces may affect the actual amount of federal coal that would be developed over the planning horizon in the study area. The RFD represents one path future development may take, based on the expected behavior of existing mine operators and the coal markets they will face over the next 20 years. This forecast assumes that the scheduled retirements of several coal-fired power plants that use coal mined in the study area will take place and that area mine operators will not be able to find alternative buyers for this coal. In both the early and later 2020s, total annual production from existing mines will permanently shift to a lower level to reflect the loss of these contracts. Aside from these planned closures, the forecast assumes that total mine output is stable from year to year. The BLM obtained the information in this appendix from mine operators and BLM records. The RFD does not forecast different production levels across the alternatives.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	BLM suggests that "demand" cannot change with price changes.38 If the agency meant that demand for any individual fuel types, compared to others, cannot change with relative price changes, that is directly contradicted by basic economic theory as well as empirical evidence. If the agency is perhaps suggesting that overall electricity demand cannot easily change with price changes, on the assumption that overall energy demand is inelastic, that too is not consistent with theory or evidence.	Appendix D has been revised to reflect the Wright Area Remand EA, FONSI, and Decision Record approved in June 2019. As such, BLM is aware supply and demand within the context of the electric power system does not easily conform to the norms of the general supply and demand model of other commodities. As noted in the revised Appendix D, this is due to multiple factoring including 1) limited storage capacity, which requires production and supply on demand, 2) utilities within the traditional vertically integrated system with monopolies within a geographic region, and 3) other nonmarket mechanisms include spot market price caps, operating reserve requirements, non-price rationing protocols, and administrative protocols for managing system emergencies. The RFD is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. The RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels across the alternatives. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	BLM assumes in its analysis that all coal will be combusted in U.S. energy markets.61 The Miles City DSEIS further bases its production forecasts for two mines on the assumption that the mines will only look for domestic contracts.62 But in fact, as the Miles City DSEIS acknowledges, "a significant percentage of coal is not combusted in the planning area and is shipped to foreign markets; this trend is anticipated to persist or increase."63 In fact, the Decker and Spring Creek mines export 80% of their production, and coal production in the planning areas could increase because of global demand.64 Though BLM claims that other mines besides Decker and Spring Creek cannot meet the quality requirements for exports, and so "global market demand would not influence them,"65 BLM ignores that the entire coal market is a global market. If those other mines can fill domestic demand, then other sources of domestic supply that do meet the requirements for export are free to increase their exports. In that way, the plans overall support and contribute to increasing U.S. exports of coal. And predictions from the EIA's reference case in the 2019 Annual Energy Outlook notwithstanding, if U.S. coal supply and prices change from the assumptions built into the reference case, exports could change as well.	Future federal coal development in the MCFO depends on the level of future coal demand, both domestic and international, which is expected to be fulfilled from federal and nonfederal coal deposits. Many market and societal forces may affect the actual amount of federal coal that would be developed over the planning horizon in the study area. The RFD represents one path future development may take, based on the expected behavior of existing mine operators and the projected demand for coal they will face over the next 20 years. This forecast assumes that the scheduled retirements of several coal-fired power plants that use coal mined in the study area will take place and that area mine operators will not be able to find alternative buyers for this coal. In both the early and later 2020s, total annual production from existing mines will permanently shift to a lower level to reflect the loss of these contracts. Aside from these planned closures, the forecast assumes that total mine output is stable from year to year. The BLM obtained the information in Appendix C from mine operators and BLM records. The RFD does not forecast different production levels across the alternatives.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	BLM also fails entirely to consider other modeling options besides NEMS. For example, in addition to NEMS, the Surface Transportation Board has also used ICF International's Integrated Planning Model "to assess coal production . . . and distribution patterns."69 Most importantly, the Department of the Interior has already taken some inputs from NEMS, simplified the details, and developed its own model, MarketSim. Though developed by and primarily used by the Bureau of Ocean Energy Management going back decades,70 BLM itself has also now used MarketSim in its Draft Supplemental EIS for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth 2 Development Project.71	This SEIS is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	Regardless of the precise numbers, BLM wrongly assumes that the economic effects will not vary across scenarios and will be additional economic gains that will not be offset by changes in economy activity in other regions or sectors.80 BLM supposes that if coal production is halted in these areas, other mines will "absorb the market share."81 Yet if that is true, then production of these mines is coming at the expense of increased production at other mines in the region or elsewhere.	This SEIS is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives, thus no substitution of fuel sources is anticipated between the alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Institute for Policy Integrity, New York University School of Law	But as BLM is well aware, well over 90% of coal production in the areas and 40% of U.S. coal production already comes from federal leases, and the federal government already collects royalties on those leases. If BLM's perfect substitution assumption were correct, such that other sources of coal can perfectly substitute for this coal, then it must also be true that coal leased under these plans simply substitutes for other sources of coal that would otherwise be mined. At least some of those other sources-perhaps 40 or 90 percent-would surely have been other federal leases. But if coal leasing under these plans perfectly supplant those other leases, those other leases lose the opportunity to generate federal revenue. Yet the DSEISs never subtract from their calculations of supposedly large economic effects (like income and taxes and royalties) the lost benefits from all those would-be sources of coal that will be supplanted by leasing under these plans. Similarly, even substitute private leases produce tax revenue, and yet the DSEISs never subtract from their calculations of incomes or state revenues (like severance taxes, property and production taxes, or sales and use taxes) the lost benefits from all those would-be sources of coal that will be supplanted by leasing under these plans.	The RFD is specific to the Miles City Field Office. The information from the RFD was obtained from mine operators and BLM records. The RFD forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. The RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels across the alternatives, thus no substitution of fuel sources is anticipated between the alternatives. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C. The economic effects were addressed by an economic impact analysis, not an economic cost-benefit analysis. Cost-benefit analyses and regional economic impact analyses are very different methods that are focused on quantifying/monetizing different measures (social welfare and economic activity respectively) and are based upon differing assumptions and terminology and are not interchangeable. As such, results from a regional economic impact analysis are not considered benefits or costs (Watson et al. 2007).
Environmental Defense Fund, et al.	Therefore, even if the Court defers to BLM's decision to not apply the social cost of greenhouse gases in these DSEISs, doing so is clearly beneficial. Doing so is also straightforward, as all that is required once emissions are quantified is to multiply each year's emissions by the corresponding social cost of greenhouse gas values, discount future climate costs back to present value, and sum across all years. Because the additional information provided by the social cost of greenhouse gas protocol will "benefit" both the public and decisionmakers, BLM should execute the basic math involved (multiplication and addition) and apply the social cost of greenhouse gases.	Regarding the social cost of carbon, Section E.3 below this table for a response.

Organization Name	Comment Text	Response Text
Environmental Defense Fund, et al.	BLM's barebones and inaccurate explanations for why it did not use the social cost of greenhouse gases here does not excuse the failures to analyze and disclose the significance of emissions resulting from these plans -especially when, as here, BLM makes false representations, such as claiming that "it is not possible to accurately distinguish the impacts on global climate change from GHG emissions originating just from the planning area," 15 when in fact the social cost of greenhouse gas protocol is exactly such a tool.	Regarding the social cost of carbon, Section E.3 below this table for a response.
Environmental Defense Fund, et al.	By failing to use available tools, such as the social cost of greenhouse gases, to analyze the significance of emissions, BLM violates NEPA.	Regarding the social cost of carbon, Section E.3 below this table for a response.
Environmental Defense Fund, et al.	Using the social cost of greenhouse gas metrics to monetize climate damages fulfills NEPA's legal obligations in ways that quantification alone cannot.	Regarding the social cost of carbon, Section E.3 below this table for a response.
Environmental Defense Fund, et al.	BLM therefore falls short of its legal obligations and statutory objectives by focusing just on volume estimates. Similarly, courts have held that just quantifying the acres of timber to be harvested or the miles of road to be constructed does not constitute a "description of actual environmental effects," even when paired with a qualitative "list of environmental concerns such as air quality, water quality, and endangered species," when the agency fails to assess "the degree that each factor will be impacted.	Regarding the social cost of carbon, Section E.3 below this table for a response.
Environmental Defense Fund, et al.	If BLM truly believes the plans will result in no economic benefit when viewed from a national perspective, it should say so clearly; instead, the DSEISs touts millions in alleged economic upside, with no mention of any offsetting downside.	Regarding the social cost of carbon, Section E.3 below this table for a response.
Environmental Defense Fund, et al.	in calculating and reporting output and royalties, BLM has presented a monetized estimate of the supposed social benefits of the plans. Consequently, BLM must also use readily available tools to monetize the social costs of the coal, oil and gas development. It is arbitrary to apply inconsistent protocols for analysis of some effects compared to others, and to monetize some effects but not others that are equally monetizeable.	Regarding the social cost of carbon, Section E.3 below this table for a response.

Organization Name	Comment Text	Response Text
	FLPMA	
Western Organization of Resource Councils, et al.	First, it is clear that FLPMA's multiple use mandate does not require BLM to prioritize mineral development over other uses, including Conservation Groups' preferred alternative of closing the Buffalo and Miles City planning areas to all fossil fuel development in order to avoid using public lands to exacerbate climate change. The fact that coal leasing is one possible use for public lands does not mean that the Department of the Interior is required to manage public lands to accommodate coal leasing for decades into the future. FLPMA does not mandate that every use be accommodated on every piece of land; rather, balance is required. See Norton v. S. Utah Wilderness Alliance, 542 U.S. 55, 58 (2004).	See Section 2.2.6 of the Final SEIS/Proposed RMPA, which describes the rationale for not considering an alternative which considers no new leasing. Refer to Appendix A, the coal screening process, which informs potential land use decisions regarding coal leasing availability under the alternatives analyzed.
Western Organization of Resource Councils, et al.	Development is a possible use, which BLM must weigh against other possible uses-including conservation to protect environmental values, which are best assessed through the NEPA process. Thus, an alternative that closes the [proposed public lands] to development does not necessarily violate the principle of multiple use, and the multiple use provision of FLPMA is not a sufficient reason to exclude more protective alternatives from consideration.	See Section 2.2.6 of the Final SEIS/Proposed RMPA, which describes the rationale for not considering an alternative which considers no new leasing. Refer to Appendix A, the coal screening process, which informs potential land use decisions regarding coal leasing availability under the alternatives analyzed.
	Surface Owner Consultation	
Farmland Reserve, Inc.	Lands with coal potential may be eliminated from further consideration for leasing based on qualified surface owner preference. We respectfully request that when making any final decision for future coal leasing that you give utmost consideration to our preference for excluding federal minerals underlying our lands.	Surface owner consultation is required at the land use planning stage for coal screen #4, which was completed between January 28 and August 15, 2019. A signed surface owner consent is required before leasing split-estate lands, in accordance with 43 CFR 3427.1 and 3427.2. See Appendix A for additional details.
Farmland Reserve, Inc.	We prefer to have no mineral leasing occur on land where FRI doesn't own the mineral estate (split-estate) and cannot control mineral lease provisions which may not sufficiently protect the overlying and/or surrounding surface. This is especially true where there are conflicts with FRI's surface uses for agriculture, livestock husbandry, and wildlife habitat management. While surface use agreements may be negotiated, terms of the lease itself can impose burdens to the surface beyond what a surface use agreement can address.	Surface owner consultation is required at the land use planning stage for coal screen #4, which was completed between January 28 and August 15, 2019. A signed surface owner consent is required before leasing split-estate lands, in accordance with 43 CFR 3427.1 and 3427.2. See Appendix A for additional details.

Organization Name	Comment Text	Response Text
Farmland Reserve, Inc.	Based upon the above, we respectfully request the BLM to keep us fully informed of any proposals, including proposed or final RMP decisions, designed to lease federal minerals underlying land owned by FRI. We further request that our parcels be depicted in the Miles City Field Office SEIS and RMPA Appendix, Figure A-22 - Screen 4 Consultation with Qualified Surface Owners, as "Not in favor (unacceptable for further consideration for coal lease)" for purposes of the coal screening process. SEE ATTACHMENT FOR ENCLOSURE - TEMPLATE DOCUMENT FOR SURFACE OWNER CONSULTATION	These lands are not in the area of coal potential so would not be acceptable for further consideration for leasing. Refer to Map A-22 in Appendix A and Maps 2-2 and 2-3, which illustrate Screen 4 and areas of acceptable acres under Alternatives B and C.
Western Organization of Resource Councils, et al.	Strip mining alters stream-flow patterns and affects spring flows. Pit inflows discharge into the drainages in the area, degrading their water quality. The connectivity of the surface water with groundwater is disrupted and compromised. Additionally, soils surrounding coal seams and the underground aquifers in coal seams are highly laden with sodium salts. Improper discharge of these sediments and waters impact the surface water quality. The DSEIS reports that landowners responded to the questionnaire asking if they are in favor or not in favor of coal development on their lands. Figure A-22 in Appendix A of the DSEIS shows the results of the landowner screen, and from the map it is clear many landowners who are not in favor of coal development live nearby those who are. Under Alternative B, it appears that coal determined acceptable for leasing through BLM's coal screens is nearby - and in some cases adjacent to - lands where the landowner consulted is not in favor of coal development. Even if a landowner responded they are in favor of coal development, they may still experience the impacts of coal development if coal is leased and developed on adjacent lands. This will mainly be through the upstream and downstream impacts to their water resources described above.	Surface and subsurface water resources (perennial streams, wetlands, riparian areas, 100-year floodplains, alluvial valley floors, source water protection areas, and municipal watersheds) were determined to be unacceptable for further consideration for leasing or unsuitable with an exception. Refer to Appendix A, the coal screening process, which informs potential land use decisions regarding coal leasing availability under the alternatives analyzed.

Organization Name	Comment Text	Response Text
Prairie County, Montana	Private property rights our very high priorities in Prairie County. But, Prairie County also believes that "property rights" in general are important and not just private. Surface ownership never should have the ability to dictate or give permissive use of subsurface use or extraction because that is infringement on another's "property right". Rule of thumb: One property right can not reduce the rights of another without just compensation. Surface ownership always has the right to be justly compensated because of use and disturbance of his/her/it's property when using or extracting a subsurface resource. In turn, if subsurface rights are infringed on by surface rights, surface ownership should have to justly compensate subsurface ownership. The 489,619 acres should still be considered for coal leasing unless the surface owner is going to fairly compensate the federal government for taking acres out of consideration. The action to not consider 489,619 acres due to lack of support from surface ownership sets a very disturbing precedence.	Compensation is set through federal regulations and state law and is outside the scope of this RMPA/SEIS. Surface owner consultation is required at the land use planning stage for coal screen #4, which was completed between January 28 - August 15, 2019. A signed surface owner consent is required prior to leasing split-estate lands in accordance with 43 CFR 3427.1 and 3427.2.
FLPMA Multiple-Use		
Western Organization of Resource Councils, et al.	Multiple-use screens did not include a thorough analysis of coal leasing impacts to agriculture. The new coal screens BLM conducted in developing Alternatives B and C included multiple-use screens that considered conflicts with oil and gas wells; oil and gas units; perennial, riparian, and wetland resources; conservation easements; recreation areas; sport fishing reservoirs; areas of critical environmental concern; and cultural viewsheds. Conflicts with area agriculture were not explicitly considered and we believe BLM must consider these impacts before selecting an appropriate Alternative.	Surface owner consultation is required at the land use planning stage for coal screen #4, which was completed between January 28 and August 15, 2019. A signed surface owner consent is required before leasing split-estate lands, in accordance with 43 CFR 3427.1 and 3427.2. Agriculture can be primarily found in river bottoms and areas with alluvial valley floors. All perennial streams, 100-year floodplains, alluvial valley floors, wetlands, and riparian areas are determined unacceptable for further consideration for leasing, thereby affording protection to agricultural lands.

Organization Name	Comment Text	Response Text
Prairie County, Montana	In very rural counties with large federal holdings, federal revenue sharing for the use or extraction of both renewable and non-renewable resources are a significant part of a county's non-tax revenue. This includes Prairie County. Even though BLM assumes there is no interest to lease coal within Prairie County, we have a difference of opinion. In the 1960,s, Peabody Coal was interested in constructing a mine that entailed areas around Little Sheep Mountain where we know there are significant deposits of coal. Also, within the current century, there was discussion with landowners about construction of a 500 Megawatt coal fired generation plant both in western McCone County and just north of the Yellowstone River between Miles City and Terry in Prairie County. In the latter case, Prairie County would have received significant federal revenue sharing as well as property tax. The issues of concern are: a: by restricting the potential federal coal extraction, you reduce the value of adjacent private subsurface rights because potential reduction of volume of raw product makes what is still available less likely to be leased. b: due to population caps within the current PILT formula, rarely can PILT compensate rural counties for lose of federal revenue sharing dollars; where in more urban areas it does. Therefore, rural counties must support the potential of federal resource use revenue shared within their counties. c: federally limited resource use reduces the potential of increasing property tax base. Unless other federal programs are in effect to compensate Prairie County for potential loss revenue due to federal restrictions on natural resource use, Prairie County opposes all restrictions within the SEIS/RMPA in question. Furthermore, your analysis suggests that potential use of coal within your jurisdiction has already been satisfied by current coal leases. If your analysis is accurate, leaving status quo (alternative A) should satisfy the court order. Prairie County suspects that the action of selecting Alternative B is just to show that some action was taken to detour litigation, but may make it difficult to again to make those coal deposits available for lease.	Alternatives B and C applies the coal screens that were required by the Court Order. Coal potential was based on geologic formation and current, as well as forecasted market conditions in the area. The coal screens were applied to lands with coal potential and federal jurisdiction. It is outside of the BLM's jurisdiction to increase the coal potential in Prairie County. The BLM determined the RFD to include the three counties with current mines because no new mines were proposed in the planning area. Compensation is set through federal regulations and state law and is outside the scope of this RMPA/SEIS. After doing required coal screens, certain additional lands are not available for coal leasing under one or more of the four screens. Therefore, action must be taken (i.e., no action is not an option based on resources).

Organization Name	Comment Text	Response Text
	Other Laws	
Montana Natural Resource Coalition	MtNRC concludes that the RMPA constitutes a Major Rule8 and Significant Regulatory Action9 as defined in 5 U.S.C. § 804(3), and under the Small Business Regulatory Enforcement Act10 (SBREFA). As a result, and irrespective of which alternative BLM selects, before any alternative and RMPA may legitimately be employed the land use planning process, the Miles City RMPA and record of decision (ROD) must be submitted to OIRA for a concurrence determination, and to the United States Congress for review under 5 U.S.C. § 801(a)(1)(A).	This RMPA does not promulgate any rules or regulations; therefore, this is outside the scope of this planning effort.
	Range of Alternatives	
Western Organization of Resource Councils, et al.	Second, the Mineral Leasing Act ("MLA") similarly does not preclude BLM from considering a No Leasing Alternative, including an alternative where BLM would not issue any future leases for coal, oil, or gas in the Buffalo and Miles City planning areas. The governing statute for oil and gas, the MLA, states: "All lands subject to disposition under this Act which are known or believed to contain oil or gas deposits may be leased by the Secretary." 30 US.C. § 226(a) (emphasis added); see also Udall v. Tallman, 30 U.S. 1, 4 (1965) (MLA "left the Secretary discretion to refuse to issue any lease at all on a given tract"); Burglin v. Morton, 527 F.2d 486, 488 (9th Cir. 1975) ("The permissive word 'may' in Section 226(a) allows the Secretary to lease such lands, but does not require him to do so."); Pease v. Udall, 332 F.2d 62, 63 (9th Cir. 1964) ("[T]he Mineral Leasing Act has consistently been construed as leaving to the Secretary, within his discretion, a determination as to what lands are to be leased thereunder.")	Section 2.2.6 has been updated to better explain that any new leases beyond what were considered in the RFD would be outside of the scope of impacts analyzed in this SEIS and would result in additional NEPA analyses.
Individual	The Miles City assessment does not consider no extraction of coal	There are valid leases under which mining has been authorized, which constitute valid existing rights. It is outside the scope of the SEIS to consider revoking these rights. See also response to comments regarding a no leasing alternative and Section 2.2.6.
Individual	Please include an alternative in the EWIS that uses alternative energy on BLM lands rather than coal. Please re-write your project purpose and need to allow such an alternative.	The purpose and need is in response to the court order. An alternative that uses alternative energy other than coal would not be responsive to the court order and is outside the scope of this RMP. The 2015 RMP identifies areas that are available and unavailable for renewable energy.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	In both the Buffalo and Miles City DSEISs, BLM failed to consider any alternative that reduced the amount of coal available for development.	The Miles City Field Office has developed a range of alternatives for consideration in response to the court order issued by the U.S. District Court (case 13 CV16-21-GF-BMM) as amended March 26, 2018.
Western Organization of Resource Councils, et al.	Fourth, BLM is incorrect that the presence of coal leases now requires BLM to leave the planning area open to leases in the future. This excuse fails on its face. The alternative proposed by Conservation Groups would not extinguish existing leases, as BLM suggests, but instead preclude issuance of future leases in the planning areas. As explained in detail above, BLM has broad authority to consider such a policy choice for its management of public lands, so it must consider the alternative under NEPA, and it should ultimately select that alternative as it is the only one that adequately protects the public interest, instead of benefitting a small handful of coal, oil, and gas companies.	Section 2.2.6 has been updated to better explain that any new leases beyond what were considered in the RFD would be outside the scope of impacts analyzed in this SEIS and would result in additional NEPA analyses.
Western Organization of Resource Councils, et al.	BLM must consider No Leasing and Reduced Leasing Alternatives across all fossil fuels - coal, oil, and gas generated under the plans.	Considerations for oil and gas leasing is outside the scope of this RMPA, as described in Chapter 1; such decisions were made in the 2015 Approved RMP/Record of Decision. The purpose of and need for this SEIS and RMPA are to respond to the court order described in Chapter 1, which does not include decisions related to oil and gas. Section 2.2.6 has been updated to better explain that any new leases beyond what were considered in the RFD would be outside the scope of impacts analyzed in this EIS and would result in additional NEPA analyses.
Western Organization of Resource Councils, et al.	Finally, BLM is incorrect that "claims of the benefits of total closure have not given a reasonable basis for offsetting these costs or provide a benefit to making the decision area unavailable for leasing." Miles City DSEIS at 2-7. Closing the Powder River Basin to new fossil fuel leasing on public lands would dramatically reduce the supply of coal, oil, and gas and result in the use of alternatives that generate fewer or no GHG emissions, particularly when it comes to coal. Conservation Groups are not asking BLM to perform a cost-benefit analysis across alternatives. It is not the public's job to provide BLM with a cost benefit analysis of a reasonable alternative, nor is it necessary for a reasonable alternative under NEPA to "offset[] costs," as BLM implies.	The quoted text and paragraph have been deleted. The MCFO does not have the authority to close the entire Powder River Basin to fossil fuel leasing; such an action is outside the scope of this RMPA/SEIS. Section 2.2.6 has been updated to better explain that any new leases beyond what were considered in the RFD would be outside the scope of impacts analyzed in this EIS and would result in additional NEPA analyses.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils	BLM should analyze and select a No Leasing alternative that precludes issuance of new federal leases of coal, oil, and gas throughout both the Buffalo and Miles City Field Offices	Section 2.2.6 has been updated to better explain that any new leases beyond what were considered in the RFD would be outside the scope of impacts analyzed in this EIS and would result in additional NEPA analyses.
Western Organization of Resource Councils	By refusing to consider a No Leasing alternative and refusing to study the market and climate effects of its actions, BLM has attempted to dodge any responsibility for managing public lands and minerals in a way that is compatible with the urgent needs to reduce carbon emissions.	Section 2.2.6 has been updated to better explain that any new leases beyond what were considered in the RFD would be outside the scope of impacts analyzed in this EIS and would result in additional NEPA analyses.
Western Organization of Resource Councils	Instead, the agency failed to consider all reasonable alternatives and failed to take the 'hard look' at the environmental consequences of its action that NEPA requires. The solution is for BLM to analyze a new alternative, No Leasing, and select this alternative for the lifespan of the resource management plans.	Section 2.2.6 has been updated to better explain that any new leases beyond what were considered in the RFD would be outside the scope of impacts analyzed in this EIS and would result in additional NEPA analyses. Alternatives considered but eliminated from detailed analysis are still within the range of alternatives considered.
Individual	Keep this out of the courts by making an accurate and more inclusive NO LEASE option. The past omission of all reasonable alternatives and failure to include the environmental consequences of its action that NEPA requires is what landed this process with a judge last go-round.	Section 2.2.6 has been updated to better explain that any new leases beyond what were considered in the RFD would be outside the scope of impacts analyzed in this EIS and would result in additional NEPA analyses. Furthermore, the purpose of and need for the SEIS/RMPA is to respond to the court order, as described in Chapter 1, and the range of alternatives is responsive to the purpose and need.
Public Outreach		
Yankton Sioux Tribe	We are opposed to any extraction (See attached Resolution) on Treaty lands and do not think proper consultation has been met with the Yankton Sioux Tribe.	No site-specific decisions are being made in this SEIS regarding surface disturbance. Additional consultation would take place at the time of leasing.
Resource Topics Eliminated		
Individual	The Miles City assessment does not ... address impact on indigenous peoploe	See page 1-7 of the draft SEIS. Environmental justice impacts were disclosed in the 2015 Proposed RMP/Final EIS. There has been ongoing public collaboration and outreach during this SEIS and RMPA process, including tribal consultation.

Organization Name	Comment Text	Response Text
Spring Creek Mine	Figure 2.2 shows the "unacceptable" areas in grey. Overlaying the figure onto the SCC Mine Permit boundary and near term coal lease applications, shows several grey areas within the mine permit boundary which are mined/reclaimed and/or leased for surface disturbance. Issued leases for mining and surface disturbance do not appear to be accounted for in the EIS analysis. (See attachment for Figure 2.2)	The BLM will continue to recognize valid existing rights where there are existing leases. If an undeveloped lease is relinquished, the coal screen results would apply to future potential leases. For the lands depicted in the comment letter, criterion 15 applies to the larger tract of land; therefore, it is unacceptable but allows for an exception. On the smaller tract of land, most of the lands are unacceptable for coal leasing, with criterion 15 applied, so there is an exception that would allow for leasing. A smaller portion of the smaller tract of land is within an alluvial valley floor, which is unsuitable for coal leasing, without exception. At the leasing stage, in accordance with 43 CFR 3461.2-1, the BLM would reapply Screen 2 (Unsuitability Criteria) using updated data, and if appropriate, BLM may change the land use plan determination without formally revising or amending the plan.
Reasonably Foreseeable Development Scenario		
Western Organization of Resource Councils, et al.	Other industry analysts predict even sharper declines: Moody's, the credit ratings agency, recently issued a forecast that coal's contribution to electricity production may drop as low as 11% from its current level of 26%.4 Moody's predicts that this nearly 60% decline will severely impact coal mines in the Powder River Basin, and thus is germane to BLM's market analysis for the planning areas. 4 Taylor Kuykendall, "Coal's share of US power generation may fall to 11% by 2030: Moody's," S&P Global Market Intelligence, July 10, 2019. Accessible online: https://www.spglobal.com/platts/en/market-insights/latest-news/coal/071019-moodys-expects-coals-share-of-us-power-generation-to-fall-to-11-by-2030. Attached as Exhibit 4.	Trends in the RFD are specific to the MCFO. The forecast production is derived from contract and future estimates provided by the operators; therefore, no modeling projections were needed to estimate forecasted production. This RFD accounts for projected closures at the Colstrip Power Plant and closure of the Lewis and Clark Power Plant in Montana. See updated text in Section 3.2.2. Refer also to Appendix A, the coal screening process, which informs potential land use decisions regarding coal leasing availability under the alternatives analyzed.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	New, non-speculative information has arisen that BLM MCFO should incorporate in revised RFDs for the final SEIS to account for recently announced closures of major consumers of Montana coal. The closure of Colstrip Steam Electric Station's units 1 and 2 at the end of 2019 was announced in June, several weeks following the release of the DSEIS.5 Data from an EIA report shows that, collectively, the four boilers at Colstrip consumed 18-26% of coal mined in Montana in the last five years for which data is available (2013-2017), as displayed in the table below. Using a conservative estimate that half of that coal is consumed by boilers 1 and 2, which will close at the end of 2019, BLM's forecast for coal mining should be adjusted down by at least 4 million tons per year for the remaining 19 year timeframe, resulting in a total reduction of 76 million tons per year. As that figure is 10% of the estimated total production during the timeframe of the plan, it is far too large to ignore. A similar reduction of acres affected by coal mining is also required. 5 Tom Lutey, "Colstrip Units 1 and 2 will close in 2019," Billings Gazette, June 11, 2019. Accessible online: https://billingsgazette.com/news/state-and-regional/colstrip-units-and-willclose- in/article_cac5e705-d9e6-5954-af8f-9dc26b584a0e.html. Attached as Exhibit 5.SEE ATTACHMENT FOR TABLE - Comparison of Montana Coal Production with Colstrip Power Plant	Trends in the RFD are specific to the MCFO. The forecast production is derived from contract and future estimates provided by the operators; therefore, no modeling projections were needed to estimate forecasted production. This RFD accounts for projected closures at the Colstrip Power Plant and closure of the Lewis and Clark Power Plant in Montana. See updated text in Section 3.2.2.
Western Organization of Resource Councils, et al.	While modifying the RFDs to account for the closure of Colstrip units 1 and 2, BLM MCFO should take the opportunity to justify the unusual pattern of coal production it forecasts. Historic data for Montana coal production since 2001 show alternating peaks and troughs of coal production, never reaching above 45 million tons per year, with each trough deeper than the last, as demonstrated in the chart below. BLM's forecast, however, foresees a spike in coal production in the near term followed by flat production that steps down over the RMP's 20-year timeframe. The spike is significant: coal production is forecasted to increase more than 10 million tons per year in 2020 from 2019 levels, increasing again in 2021 to 46 million tons per year. SEE ATTACHMENT FOR TABLE - Montana Coal Production Historical and Projected	Trends in the RFD are specific to the MCFO. The forecast production is derived from contract and future estimates provided by the operators; therefore, no modeling projections were needed to estimate forecasted production. This RFD accounts for projected closures at the Colstrip Power Plant and closure of the Lewis and Clark Power Plant in Montana. See updated text in Section 3.2.2.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	BLM articulates no reason why coal production will spike by nearly 30% in the coming years, much less why coal production will reach levels above historical production of the last 20 years. The two major factors cited by BLM that affect demand for coal from mines within the planning area - retirements of coal-fired power plants and volatility in the overseas coal export market - suggests decline of coal demand, or at best uncertainty about future demand levels. EIA forecasts declining to flat coal production in western states over the same timeframe. BLM's forecasted spike is even less credible in that it does not consider the additional production of the one Montana coal mine that falls outside the MCFO planning area. Signal Peak Energy's Bull Mountains No. 1 mine has produced coal in the range of 4-9 million tons per year over the last decade, a meaningful contribution to Montana's overall coal production. When incorporating reasonably foreseeable production from Signal Peak Energy based on historical levels, MCFO's forecast suggests Montana coal production may top 50 million tons per year in the coming years. This projection exceeds recorded production and cuts against the general market trends foreseen by EIA and acknowledged by BLM MCFO. It must be justified.	Trends in the RFD are specific to the MCFO. The forecast production is derived from contract and future estimates provided by the operators; therefore, no modeling projections were needed to estimate forecasted production. This RFD accounts for projected closures at the Colstrip Power Plant and closure of the Lewis and Clark Power Plant in Montana. See updated text in Section 3.2.2. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. .

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	The attached report of economist Dr. Thomas Power11 analyzes available energy economy models and concludes that the two models best suited to this type of analysis, based on the prior use by other agencies and the known characteristics of the models, are EIA's National Energy Modeling System, used to generate its widely cited Annual Energy Outlook reports, and ICF International's Integrated Planning Model ("IPM"), used by EPA to evaluate market responses to various policy proposals since at least 2004.12 11 Thomas Michael Power and Joel M. Brown, "Assessing the Ability of Contemporary Models to Calculate the GHG Implications of Federal Coal Leasing Decisions and Other Federal Energy Management Decisions," Power Consulting, (May 21, 2015). Attached as Exhibit 8.	This SEIS is specific to the Miles City Field Office. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.

Organization Name	Comment Text	Response Text
Western Organization of Resource Councils, et al.	According to ICF, its Integrated Planning Model uses a linear optimization framework and can be used to evaluate changes in wholesale power dispatch taking into account system reliability, environmental constraints, fuel choice, transmission, and capacity expansion.13 ICF's IPM has been used in recent years to evaluate the market and environmental impacts of several high-profile proposals related to the extraction and transportation of fossil fuels, including the U.S. State Department's review of the Keystone XL tar sands pipeline, the Surface Transportation Board's evaluation of the proposed Tongue River Railroad... 13 ICF International, "Integrated Planning Model," available at http://www.icfi.com/insights/products-and-tools/ipm (last visited June 7, 2019). Attached as Exhibit 10. irrational (i.e., contrary to basic supply and demand principles)." WildEarth Guardians v. BLM, 870 F.3d 1222, 1236 (2017)	This SEIS is specific to the Miles City Field Office. The information from the RFD scenario was obtained from mine operators and BLM records. The RFD scenario forecast indicates that area mines have already secured the needed production rights for the majority of the coal they will produce over the next 20 years, and there are adequate non-federal coal reserves from which the mines can acquire the rest. Based on input received from operators, which takes into account market trends based on their respective mining operations, the RFD does not anticipate new leasing beyond approved leases or existing lease applications and does not forecast different production levels among alternatives. The forecasted production is consistent from year to year after 2027 because the BLM considered changes in mining operations as reported by the operators, such as closure of the Lewis and Clark power plant and Units 1 and 2 of the Colstrip power plant. Production forecasts from 2019 – 2026 reflect those changes. The RFD assumes that the operators would produce at the levels reported to the BLM and the GHG emissions estimates for this SEIS reflect that. Therefore, the analysis in this SEIS is an upper limit for GHG emissions related to coal, oil, and gas development in the decision area. Therefore, an energy market model is not necessary to inform the management decision. See Sections 3.2.1 and 3.2.2 and Appendix C.
Special Status Species		
Montana Fish, Wildlife & Parks	Special Status Species Blue sucker, Northern redbelly dace, Northern pearl dace, sauger, and shortnose gar inhabit the Planning Area and are all Species of Concern in Montana. These species should be included as Special Status Species and should be included in the alternative analysis. Additionally, sicklefin chub and sturgeon chub were given a positive 90-day finding in their petition for listing by the U.S. Fish and Wildlife Service and are currently undergoing a status assessment to determine whether listing is warranted. Any and all efforts to conserve these species should be coordinated with FWP and also with other state and federal partners.	The BLM has incorporated blue sucker and shortnose gar in criterion 15. Sauger habitat has not been determined essential because they are can be found throughout the MCFO. Dace do not have essential habitat defined. At the site-specific authorization in coordination with FWP, the BLM could consider additional essential habitat if it is defined.

Organization Name	Comment Text	Response Text
	Water Resources	
EPA Region 8	The impact analysis for water resources on page 3-25 focuses on impacts to municipal watersheds. We recommend that the impact analysis be broadened to address water quantity impacts for all watersheds. For example, any surface water discharges from a coal mine or processing plant would need to obtain a MPDES permit from the State of Montana for any watersheds.	The water resources analysis is limited to municipal watersheds because that is the only water resource that could be affected by the unsuitability criteria. Because these areas could be made available through an exception, there is the potential for an impact. Other water resources are dismissed from detailed analysis, as described in Table 1-3 and Appendix A.
Montana Fish, Wildlife & Parks	it appears there is no reclamation plan for disturbed subsurface water resources and no consideration for long term impacts to water quality from fluid mineral development processes. Without explicit Best Management Practices and outlined mitigation measures in place, impacts to water resources have not been fully assessed enough for commenters to adequately compare alternatives.	There are no surface-disturbing activities authorized in this SEIS/RMPA. Impacts from fluid mineral development were analyzed in the 2015 RMP (see Water Resources, beginning on page 4-46). Best management practices can be found in the appendix titled Mitigation Measures and Conservation Actions.

E.3 RESPONSE TO COMMENTS REGARDING SOCIAL COST OF CARBON

Protocols to estimate what is referenced as the social cost of carbon (SCC) and social cost of methane (SCM) associated with greenhouse gas (GHG) emissions was developed by the federal Interagency Working Group (IWG). It assists agencies in addressing Executive Order (EO) 12866, which requires federal agencies to assess the cost and the benefits of proposed regulations as part of their regulatory impact analyses. The SCC/SCM are estimates of the economic damages associated with an increase in carbon dioxide (CO_2) and methane (CH_4) emissions and are intended to be used as part of a cost-benefit analysis for proposed rules.

While the SCC protocol was created to meet the requirements for regulatory impact analyses during rulemaking, public commenters have requested to expand the use of SCC/SCM estimates to the MCFO SEIS process. The decision was made not to use the SCC/SCM estimates for the MCFO SEIS for several reasons. First, the BLM evaluated climate impacts in the SEIS in accordance with the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions (84FR30097). It states that "A projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects."

This evaluation of climate impacts fully responds to the specific requirements of the District of Montana's ruling. Specifically, the MCFO SEIS quantifies the GHG emissions based on global warming potential (GWP) values for both 20- and 100-year time horizons. It uses this data to calculate carbon dioxide equivalents (CO_2e) (see Table 3-1 in the MCFO SEIS for a description of the GWPs and scientific relevance of these two time horizons). Additionally, GHG emissions from coal, oil, and gas from the MCFO are provided as a percentage of state, national, and global emissions.

In addition to quantifying GHG emissions, the MCFO SEIS provides a discussion on the physical manifestations of climate change and climate change projections at regional and state scales. The BLM took this approach because climate change and potential climate impacts, in and of themselves, are often not well understood by the general public (Etkin and Ho 2007; National Research Council 2009). This is in part due to the challenges associated with communicating about climate change and climate impacts. It stems in part from the fact that most impacts are due to invisible factors, such as GHGs, and there is a long lag time and geographic scale between causes and effects (National Research Council 2010).

Research indicates that for difficult environmental issues, such as climate change, most people more readily understand if the issue under the following scenarios:

- If it is brought to a scale that is relatable to their everyday lives (Dietz 2013)
- When the science and technical aspects are presented in an engaging way, such as narratives about the potential implications of the climate impacts (Corner, Lewandowsky, Phillips, and Roberts 2015)
- Examples are given and information is made relevant to the audience, while linking the local and global scales (National Research Council 2010)

The BLM's approach recognizes that there are adverse environmental impacts associated with the development and use of fossil fuels on climate change; it quantifies potential GHG emission

estimates and discusses potential climate change impacts qualitatively, thus effectively informing the decision-maker and the public of the potential for GHG emissions and the potential implications of climate change. This approach presents the data and information in a manner that follows many of the guidelines for effective climate change communication developed by the National Academy of Sciences (National Research Council 2010). It makes the information more readily understood and relatable to the decision-maker and the general public.

Commenters are wrong in stating that the MCFO SEIS "monetize[d] economic impacts." As commenters state, NEPA does not require a cost-benefit analysis (40 CFR 1502.23), although it does require consideration of economic and social effects (40 CFR 1508.8(b)). The economic analysis conducted in the MCFO SEIS is for regional economic impact. It describes the effects that agency activities may have on economic conditions and local economic activity, generally expressed as projected changes in employment, labor income, and economic output (Watson, Wilson, Thilmany, and Winter 2007).

An economic cost-benefit analysis, on the other hand, is an approach used to determine economic efficiency by focusing on changes in social welfare. It compares whether the monetary benefits gained by people from an action or policy are sufficient to compensate those made worse off and still achieve net benefits (Watson et al. 2007; Kotchen 2011). A cost-benefit analysis requires the identification and valuation of all the costs and benefits associated with an action or policy in a common monetary measure. It is often expressed either as net benefits or as a cost-benefit ratio, which indicates the value of benefits obtained from each dollar of costs (Field 2008). Since the full social benefits of energy production have not been monetized, quantifying only the costs of GHG emissions but not the benefits would yield information that is both potentially inaccurate and not useful for the decision-maker and the public.

Furthermore, foundational economic theory dictates that an economic impact does not equate to an economic benefit. Any increased economic activity, in terms of revenue, employment, labor income, total value added, and output, that is expected to occur with the proposed action is simply an economic impact, rather than an economic benefit (Watson et al. 2007). Based on their views and values, people may perceive increased economic activity as a positive impact that they desire to have occur; however, that is distinct from it being an economic benefit, as defined in economic theory and methods (Watson et al. 2007; Kotchen 2011); therefore, it is critical to distinguish that how people may perceive an economic impact is not the same as, nor should be interpreted as, a cost or a benefit, as defined in a cost-benefit analysis. The distinction is anything but semantics, because principles of benefit-cost analysis prohibit mixing economic impacts into the net benefit calculation.

Moreover, the MCFO SEIS does not treat taxes and royalties as benefits, because the BLM conducted no cost-benefit analysis. The MCFO SEIS provides information on taxes and royalties as an impact of the alternatives.

Commenters are also wrong on stating that the project's overall economic output is a monetized social benefit. The BLM presented potential changes in economic activity, using such indicators as employment, labor earnings, and output. Output is a measure of the total value of all goods produced. As represented in input-output models, such as IMPLAN, output is the total value of purchases by intermediate and final consumers, or intermediate outlays plus value

added (GDP); thus, as the BLM clearly presented in the MCFO SEIS, output is not a social benefit, and the BLM did not conduct an economic cost-benefit analysis.

Finally, the SCC/SCM, protocols do not measure the actual incremental impacts of a project on the biophysical environment in a specific geographic location. Also, it does not include all damages or benefits from GHG emissions. The SCC/SCM protocols estimate economic damages associated with an increase in CO_2 emissions, typically expressed as a 1 metric ton increase in a single year. It includes potential changes in net agricultural productivity, human health, and property damages from increased flood risk over hundreds of years. The estimate is developed by aggregating results "across models, over time, across regions and impact categories, and across 150,000 scenarios" (Rose et al. 2014, p. 8-1). The dollar cost figure that the BLM arrived at based on the SCC/SCM calculation represents the value of damages avoided if, ultimately, there is no increase in carbon or methane emissions. But the dollar cost figure is generated in a range and provides little benefit in assisting the BLM Authorized Officer's decision for this RMPA.

To summarize, the BLM did not undertake an analysis of SCC/SCM because 1) NEPA does not require cost-benefit analysis, so the BLM did not conduct an economic cost-benefit analysis, and 2) the full social benefits of energy production have not been monetized, and quantifying only the costs of GHG emissions but not the benefits would yield information that is potentially inaccurate. In the approach taken in the MCFO SEIS, the BLM qualitatively discusses climate projections and the link to GHGs and quantifies GHG emissions for the alternatives. This effectively informs the decision-maker and the public of future climate effects at a variety of scales, whereas the SCC/SCM metrics would provide only a monetary value at the global scale.

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